ENGINEERING
NEWS-RECORD

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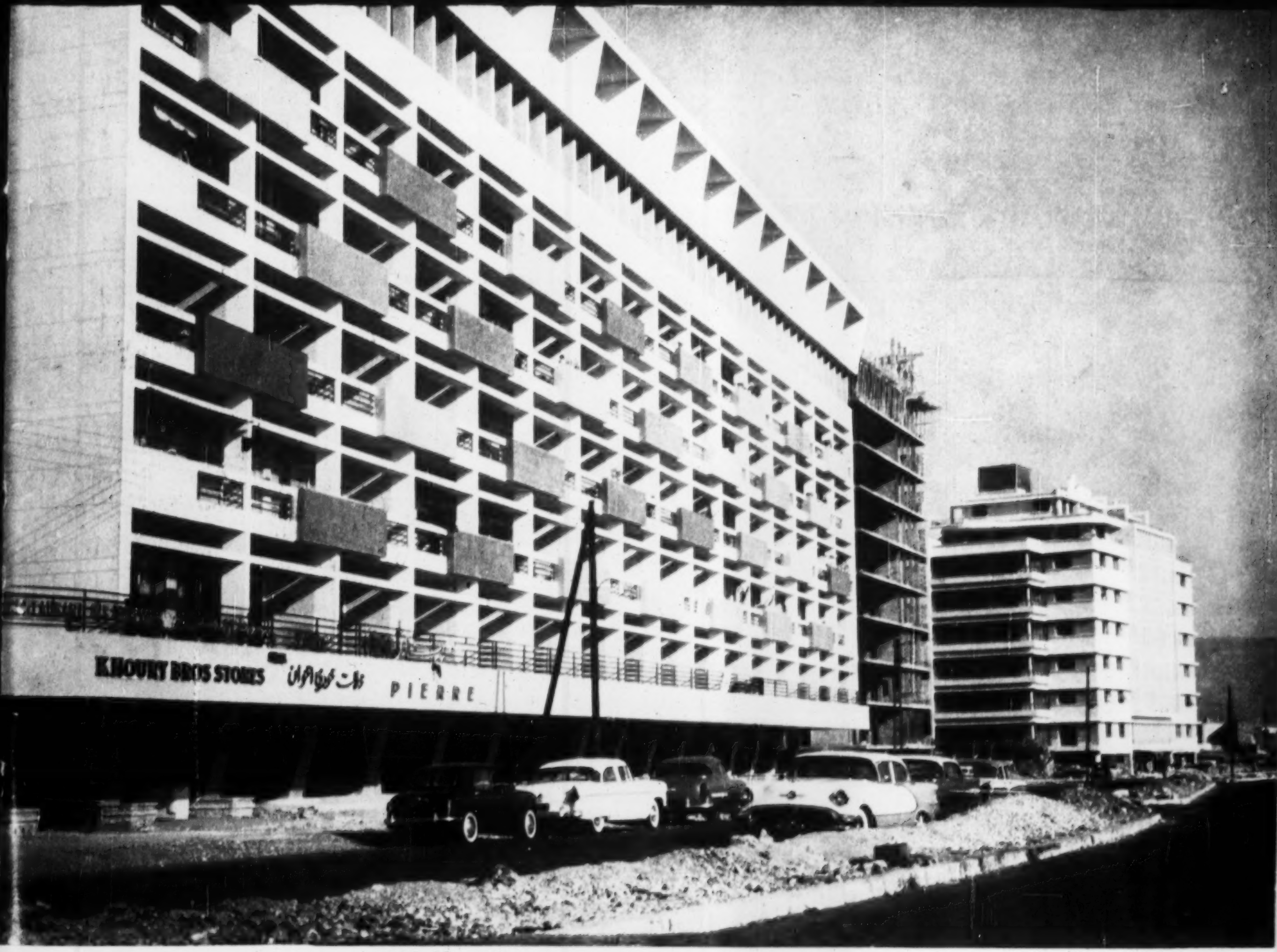
KHOURY BROS STORES
PIERRE

Middle East apartment house *p. 28*

A McGRAW-HILL PUBLICATION

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UNIVERSITY MICROFILMS INC
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**ARMCO DRAINAGE & METAL PRODUCTS, INC.**
**5007 Curtis Street, Middletown, Ohio**

Yes, send me your FREE new catalog. I have attached our company letterhead.

Engineer's name

# ENGINEERS! Here's Your new FREE Catalog on Armco Products

ARMCO PRODUCTS
ARMCO PRODUCTS

Every engineer should have this new, factual catalog on Armco Products for drainage and construction. To get your copy quickly, fill in the coupon and attach it to your company letterhead—or just write "send me your catalog" on the letterhead—and mail.

This is a two-color, 54-page, spiral-bound book loaded with information you can use. It tells you what the various products are; their sizes, uses, and advantages—plus pages of application photos.

Armco Products have been widely used for more than 50 years in highway, railway, industrial and commercial applications, and have established a reputation for material and structural durability. Armco Drainage & Metal Products, Inc., 5007 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

**Armco Construction Products**

for live power,
strength scaled to BIG JOBS,
matchless service ease...

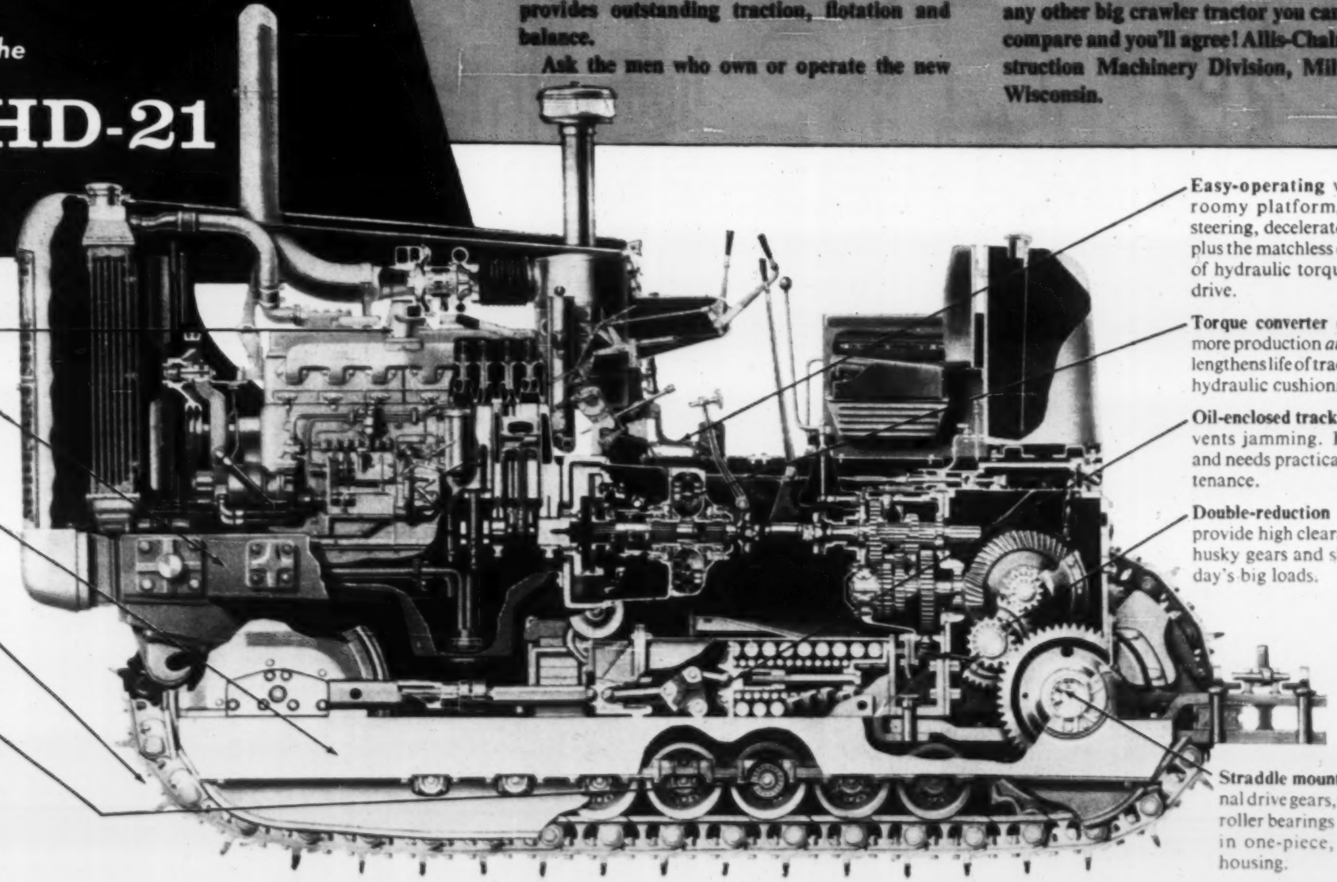
*you owe yourself*
*a close-up look at the*

# NEW HD-21

**This is live power! Allis-Chalmers' new turbo-engine delivers 225 net usable horsepower. Hydraulic torque converter drive puts this power to work—automatically provides the right pull or push for every load, at the maximum travel speed for existing conditions. New, longer track provides outstanding traction, flotation and balance.**

**Ask the men who own or operate the new high-production HD-21. On jobs that really put a tractor to the test, they all like the responsive way it handles, the way it moves into the dirt fast and keeps moving in toughest going.**

**The Allis-Chalmers HD-21 offers you more working tractor ability—dollar for dollar—than any other big crawler tractor you can buy. Just compare and you'll agree! Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.**



**New turbo-engine** brings extra power, cleaner operation, new fuel economy and longer life.

**Unit construction** with Box-A Main Frame design lets you remove major components without disturbing adjacent assemblies.

**Cost-cutting alignment**—special high-strength steel truck frames keep tracks, idlers, rollers and sprockets riding true for longer life.

**Tough track**—true-dimension machining and heat treating insure outstanding wearability under severe job conditions.

**Easy-rolling, easily maintained truck wheels**—with Positive Seals and tapered roller bearings, the HD-21's truck wheels, idlers and support rollers ride freely to deliver more usable horsepower . . . need greasing only once every 1,000 hours.

**Easy-operating** with clean, roomy platform, hydraulic steering, decelerator pedal . . . plus the matchless convenience of hydraulic torque converter drive.

**Torque converter drive** means more production *automatically*, lengthens life of tractor through hydraulic cushioning.

**Oil-enclosed track release** prevents jamming. It's reliable and needs practically no maintenance.

**Double-reduction final drives** provide high clearance, permit husky gears and shafts for today's big loads.

**Straddle mounting** of all final drive gears, with tapered roller bearings . . . mounted in one-piece, line-bored housing.

**Your Allis-Chalmers dealer will be glad to demonstrate the 21's live-power performance . . . and to prove it can help you on your big jobs.**

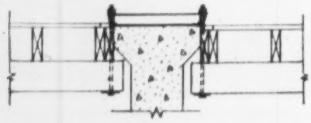
**ALLIS-CHALMERS**

*Engineering in Action*

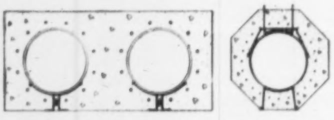
**Pre-stressed**

Tully & Di Napoli, contractors

**Long, pre-stressed concrete girders** support the deck of this bridge at Idlewild Airport, New York, designed by the Port Authority. Deck was engineered by Precrete, Inc. Richmond Free-Fit Offset Hanger Frame-Tys, easily adjustable for various slab heights and haunch conditions, were used to support the forms.

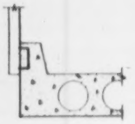


**A few Richmond pre-stressing items**



**Chairs** for support and hold-down of cardboard tubing in pre-stressed beams and piles.

**Spacers** for spirals of pre-stressed piles.



**Inserts** for railing-in pre-stressed slab bridges.

The increasing use of pre-stressed concrete presents numerous problems to contractors. Richmond's Technical Division is ready to assist you. If you have a problem, write to RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N.Y. or 315 South Fourth St., St. Joseph, Mo.

ENGINEERING
NEWS-RECORD

EIGHTY-THIRD YEAR OF PUBLICATION

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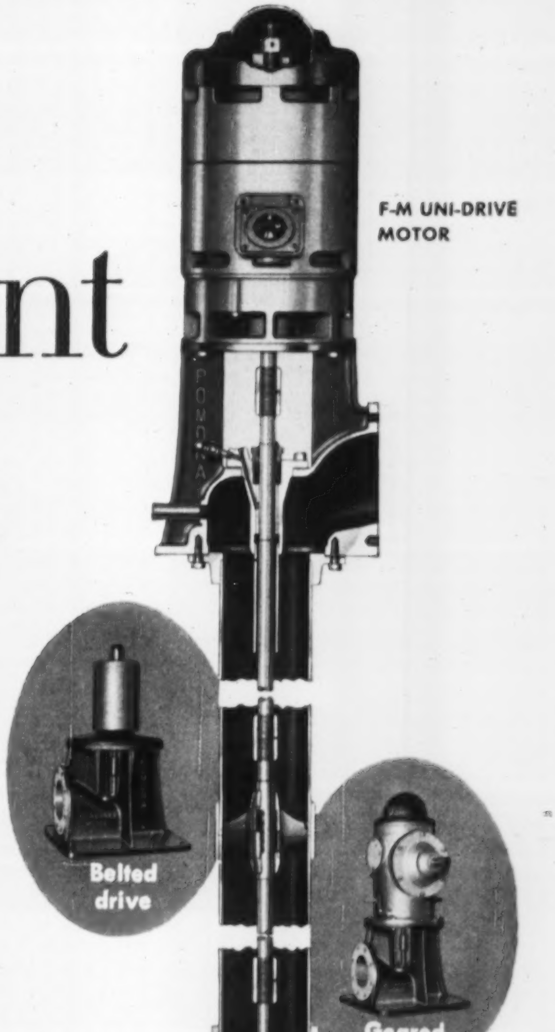
# You'll want to look into this pump



## NEW F-M POMONA WATER-LUBRICATED TURBINE PUMP

Here is an all-new, extra rugged pump designed from end to end with the cost-conscious user in mind. A close look at its strictly quality features reveals why it's recognized as today's top pump buy at *any* price.

For ruggedness of construction, simplicity of maintenance, and strictly quality design throughout, this new F-M Pomona turbine pump is today's greatest value. No other pump is so easily installed, so easy to adjust for varying field conditions, so simple to change between electric, belted or geared drive.

*Ask for details on this new F-M Pomona pump for raw water supply, air conditioning, refrigeration, cooling towers, sump pumping, dewatering, etc.* Contact your Fairbanks-Morse Sales Engineer today. Ask for new illustrated Bulletin 6957-1. Or write Fairbanks, Morse & Co., 600 So. Michigan Ave., Chicago 5, Ill.

Seven Fairbanks-Morse pump factories in the United States, Canada and Mexico build the world's greatest variety of hydraulic combinations offered by any manufacturer of liquids-moving machinery.

**FAIRBANKS-MORSE**

***a name worth remembering when you want the BEST***

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS

COMPLETELY NEW IN DESIGN AND ENGINEERING—*from the ground up*

H&B
ESTABLISHED 1867

TYPE "T"
BATCH TYPE
ASPHALT PLANT

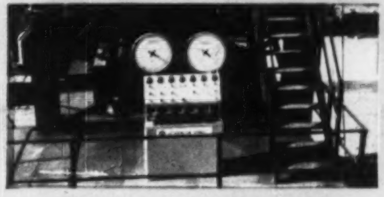
NIAGARA ASPHALT CORP.
NIAGARA FALLS N.Y.

**4 Sizes—60 to 250 Tons Per Hour** **Bulletin T-55 sent on request**

**HETHERINGTON & BERNER INC.** • *Engineers* • *Manufacturers*
701-745 Kentucky Avenue, Indianapolis 7, Ind.

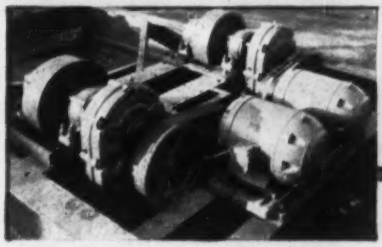
- ALL-WELDED PLATE CONSTRUCTION
- NEW TYPE DEISTER FLAT SCREEN
- CHOICE OF POWER (Electric, Gasoline, Diesel)
- INDIVIDUAL TRUNNION ROLL DRIVE ON DRYER
- SELF-CONTAINED, RELOCATED DUST BIN
- COMPLETELY FACTORY INSTALLED WIRING
- LOW PRESSURE OIL BURNERS
- FLUIDOMETER AUTOMATIC ASPHALT CONTROL
- LARGE FEEDER BINS (for direct truck loading, conveyor belt or crane feed)
- AUTOMATIC CYCLE CONTROL (optional)
- LARGE PLATFORMS—AMPLE WORKING SPACE

## JUST A FEW OF THE MANY NEW DESIGN AND ENGINEERING FEATURES THAT MAKE TYPE "T" PLANTS SO EFFICIENT

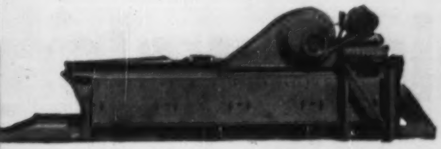


**AUTOMATIC CYCLE CONTROL:** The combination of the Fluidometer System and automatic cycle control provides for automatic control of the entire mixing cycle, and makes possible not merely more production—at lower cost per ton—but more uniform mix. Fully automatic or semi-automatic weighing and cycle control available if desired.

**LARGE FEEDER BIN:** Large capacity feeder bins are available, where required, for direct truck loading, conveyor belt, or crane feed. Also portable drive-over type truck feeder bins. Infinitely variable speed control is available to provide total feed control without changing proportions of the various aggregates.



**TRUNNION ROLL DRIVE:** Individual drives on all four Trunnion Rolls eliminate vibration—reduce maintenance costs of conventional ring gear and pinion drive. Trunnion rings are secured to the drum without rivets or bolts. No loose rivets to replace or leak sand. . . . Correct diameter to length ratio in dryer assures thorough drying and efficient heating.



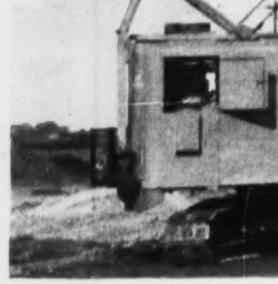
**NEW SCREEN:** New totally enclosed flat screen retains heat and dust—reduces overall height of plant—automatically compensates for expansion and contraction of cloth—is carefully balanced to eliminate vibration of plant structure. Drive mechanism and all bearings are located outside the dust enclosure.

**H & B also builds completely wheel mounted mobile plants with mixer capacities up to 6,000 lbs. and the Moto-Paver, one-machine mixer-spreader which does the complete mixing and paving job in one continuous operation. For specifications and complete information on any of these plants, see nearest H & B distributor or write direct.**

REPORT on new shovel-crane standards:
(one in a series)
LINK-BELT
K-365

# Upping cycles per shift with

## Standard on every Link-Belt Speeder, Speed-o-Matic fingertip controls minimize operator fatigue. Response is fast, positive, precise



Exclusive with Link-Belt Speeder, this true power hydraulic control system utilizes oil under pressure. An engine-driven pump supplies pressure to put the machine through its paces at the flick of the operator's wrist. Result—he's not subject to costly end-of-the-shift letdown... he stays fresh, works at high speed *all* shift.

**Hydraulic-actuated clutches . . .**
engage smoothly, surely . . . eliminate jerk, jump or lag. There's perfect feel of the load for high-speed with safety and accuracy. Self-compensating for heat and normal lining wear, the clutches eliminate frequent stops for clutch adjustments . . . convert downtime into productive time.

### Advanced design throughout

When you put a Link-Belt Speeder on your job, you get a machine that's years ahead of the field . . . a machine tops in production profit, unusually low in maintenance and service costs. See how you, too, can set new high standards of shovel-crane performance, earn bigger return on your equipment investment. See or call your Link-Belt Speeder distributor for the complete story or write: Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

14,323

### High-speed excavating

K-365 dragline with 1¾-yard bucket at left features exclusive Speed-o-Matic controls as standard equipment. System utilizes oil under pressure maintained by engine-driven pump through variable pressure valves, transmits pressure through oil directly to the hydraulic-actuated clutches. Engagement is smooth, precise. Operator has perfect feel of the load for effective work even though bucket is out of sight.

### More usable horsepower

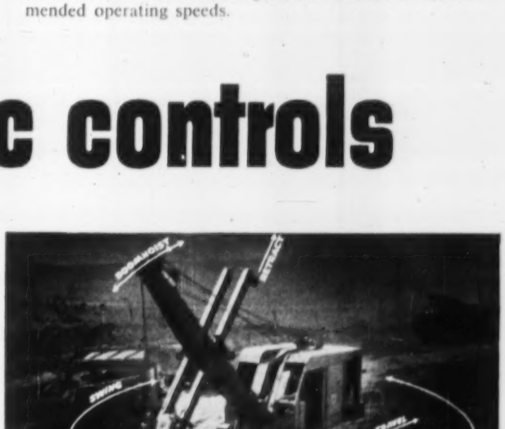
Size for size, Link-Belt Speeder shovel-cranes utilize more of the engines' available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull-plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-cranes, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.

# power hydraulic controls

### Self-compensating clutches

Hydraulic-actuated pistons automatically adjust for heat and normal lining wear. Hydraulic pressure is unaffected regardless of the distance the piston moves to engage clutch.

**Adds an hour's output per shift!** Independent-Swing-and-Travel, available on 11 models, eliminates shifting, saves 20-30 seconds each machine move. All operations are completely independent of each other.



*It's time to compare . . . with*

# LINK-BELT SPEEDER

*Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls*

# Two New High-Capacity Asphalt Plants Announced by Barber-Greene

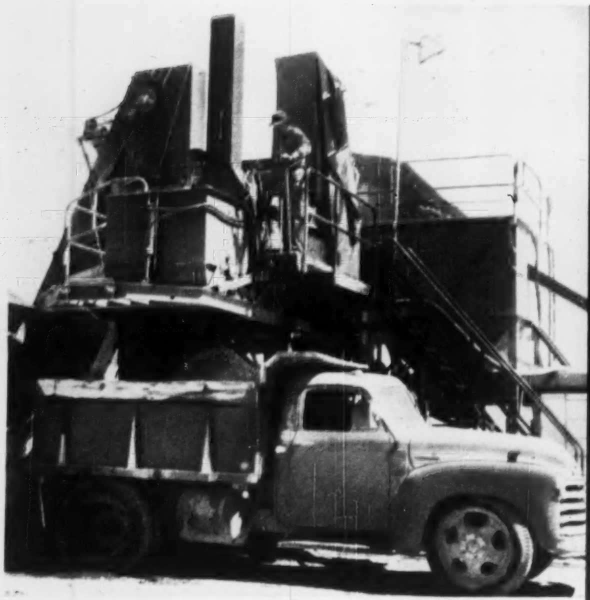
These two new continuous asphalt plants give greater versatility than ever before available. The same mixer, without alteration, may be used with any combination of plant components to produce all types of mixes—from the simplest cold mixes to the highest types which must meet the most rigid specifications. Model 847 is for high capacity. Model 848-A is for extra high capacity.

It is only necessary to transport and operate the components required for the job:

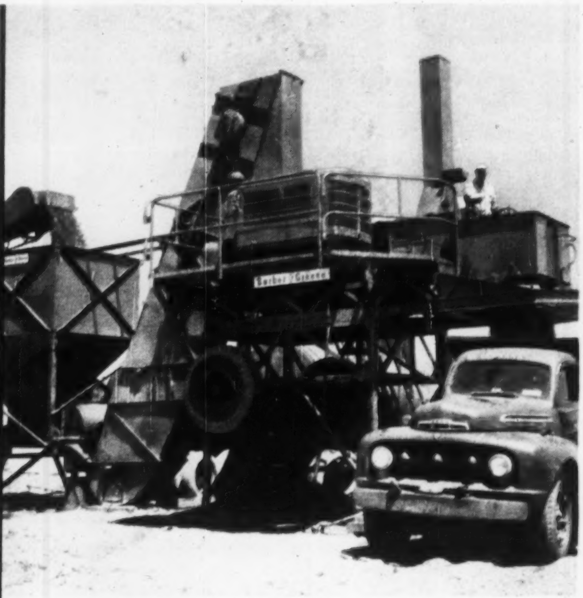
For cold mixes: Mixer + calibrated feeder

For intermediate hot mixes: Mixer + calibrated feeder + dryer

For high-type mixes: Mixer + gradation unit + dryer



Plant with four-bin gradation unit for production of highest type mixes. This multiple-aggregate plant is available in both sizes.



Cold-mix plant, available in both sizes, consists of mixer and calibrated feeder. Dryer and gradation unit may be added later.

## Both models offer these advantages:

- Unequaled versatility as described above.
- New hydraulic clamshell discharge gate saves truck time, prevents segregation.
- Transfer pump assures constant head of asphalt for metering pump, eliminates need for asphalt storage tank on mixer.
- Interlocked aggregate and asphalt feeds assure constant, correct proportioning.
- Truck pit no longer required.
- Highly portable plant components allow fast travel between jobs, pay off in more days of operation per season.
- Erection is merely a matter of spotting the units at the plant site and dropping the jacklegs.
- New, easier calibration of single-aggregate and cold-mix plants.

57-12-A

***Write for information on these two new flexible high-capacity asphalt plants.***

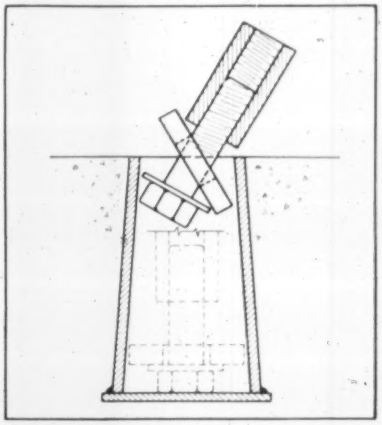
**Barber-Greene** BG

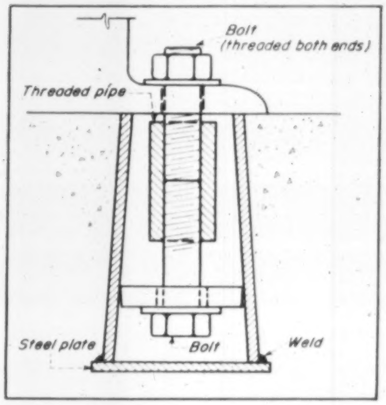
AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

# Reader Comment

## More Anchor Bolt Answers





SIR—Enclosed is sketch showing movement of anchor bolts and avoiding bolt projection above floor elevations, during construction and erection periods.

CHRISTIAN WALTER
*Chicago, Ill.*

•

SIR—A solution to the anchor bolt problem is shown in the sketch below. It offers adjustment in both the horizontal and vertical planes and does not require any bolt projection before equipment installation.

The hole in the top plate is not to be drilled until the concrete around

**Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.**

TILT UP
?
Thompson's
WATER SEAL
MANUFACTURERS
E. A. THOMPSON CO., INC.

**here's the West's Answer to your Concrete Questions!**

* **What parting compound delivers smooth concrete without leaving stains or residue that interfere with painting?**

"Thompson's Water Seal eliminated the problem of stains in our tilt-up concrete walls. Now panels are easily removed from the surface slab and painting proceeds speedily."

*ASSOCIATED CONSTRUCTION AND ENGINEERING COMPANY OF CALIFORNIA, San Francisco, Calif.*

* **Is there one curing, separating and form-sealing method that easily produces hard, dust-free surfaces?**

"Of all the chemicals we tested in our tilt-up work, Thompson's Water Seal proved the cheapest insurance against costly grief and painting troubles."

*BAYCITIES CONSTRUCTION CO., Oakland, Calif.*

* **Is it possible to prevent all moisture damage in concrete under pressure or capillary action, regardless of weather?**

"As waterproofing specialists in heavy construction work, we use Thompson's Water Seal on all concrete moisture problems with constant success and at a great saving."

*STANLEY H. KOLLER CONSTRUCTION, Crockett, Calif.*

*THOMPSON'S (deep penetrating) WATER SEAL is now Nationally distributed by*
**THE PITTSBURGH PLATE GLASS COMPANY**
*For complete specifications, write for new booklet 7-A-4*

**Thompson's** | MANUFACTURERS OF FINE PROTECTIVE CHEMICALS SINCE 1929

E. A. THOMPSON CO., INC. • MERCHANDISE MART • SAN FRANCISCO 3, CALIF.
San Francisco • Los Angeles • San Diego • Portland • Seattle • Denver • Dallas • Houston • St. Louis
St. Paul • Philadelphia • Detroit • Chicago • Cleveland • New York • Memphis

**All-round performer**

The rugged Model 14 excels from every angle. This single-cylinder, 4-CYCLE gasoline engine (5.25 hp) pays its way with standout performance over a wide work range. Like Models 9, 19, 23A, it features exclusive Magnematic Ignition for instant starting — under all conditions.

***Power partners on progress projects...everywhere!***

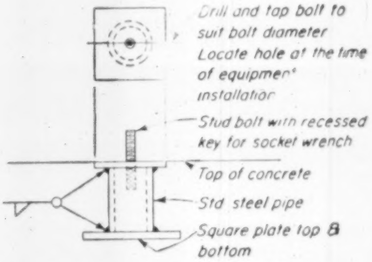
It's a fact! Briggs & Stratton 4-CYCLE engines are most welcome partners in the front lines of construction progress. They're famous for staying right in the thick of things — running smoothly, surely — regardless of "hard knocks," heat or cold, snow or rain. Insist on these engines (up to 9 hp) for your projects, too — on pumps, compressors, finishers, tampers, concrete saws, generators, elevators . . . scores of other products for progress in construction.

4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES

BRIGGS & STRATTON CORP.
MILWAUKEE 1, WISCONSIN

*Authorized Briggs & Stratton service is nearby. Find it in the Yellow Pages of your phone book under "ENGINES—GASOLINE."*

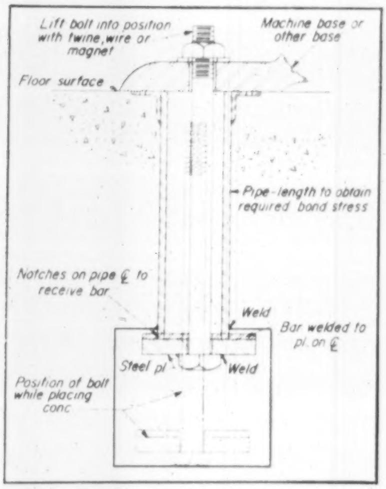
Find Us Fast In The Yellow Pages


Drill and tap bolt to suit bolt diameter Locate hole at the time of equipment installation
Stud bolt with recessed key for socket wrench
Top of concrete
Std steel pipe
Square plate top & bottom

the pipe and plate assembly has hardened. Exact pinpoint location of the assembly is not necessary; the tolerance depending on the pipe diameter only. Vertical projection can be determined at the time of equipment installation.

Manuel Savran
*Ramsever & Miller, Inc.*
New York, N. Y.

•


Lift bolt into position with twine, wire or magnet
Machine base or other base
Floor surface
Pipe-length to obtain required bond stress
Notches on pipe ℄ to receive bar
Weld
Bar welded to pl. on ℄
Steel pl
Weld
Position of bolt while placing conc

Sir—Here is an acceptable anchor bolt design that I believe could be manufactured as a standard product in all standard sizes.

L. E. Gueringer
*Aro, Inc.*
*Tullahoma, Tennessee*

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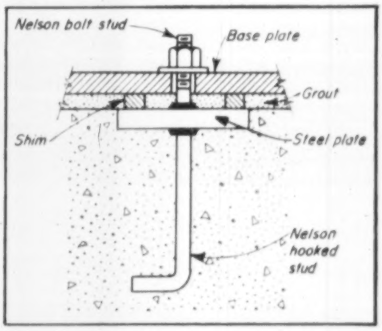
Nelson bolt stud
Base plate
Grout
Shim
Steel plate
Nelson hooked stud

Sir—H. M. McCollister's solution using a Nelson stud and a conical headed anchor (ENR Aug 15, p. 12) seems to

Going Down?

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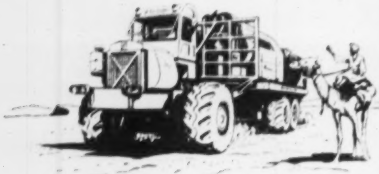

# Wilderness Freighters

by R. G. LeTOURNEAU

Take a look at the map of the world. Most of the land areas you see have very few highways. And the roads that they do have are usually pretty bad.

Now these areas are badly in need of development. But how can boxcar-size loads of heavy machines and supplies be moved into them to get the work started?

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Ordinary trucks haven't got the traction, the flotation, the power, or the strength to handle this kind of job efficiently and economically — although we all know you can't beat them on the highways they were designed for.

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Our answer is a new kind of super-powerful truck designed just for this job — and we've built them to haul loads up to 125 tons. We call them LeTourneau Transporters.

Take a medium-sized Transporter, for example. It's mounted on tires that stand 6 feet high and measure 2½ feet across, and can carry 60,000 pounds of cargo.

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This particular Transporter is a six-wheel vehicle, with power in all six wheels. The military would call it a 6x6. However, the similarity with other haulers ends right there.

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Such a machine is a good example of what the big out-door jobs take. Each type and size of job, though, has its own problems, which of course, suits us because we build the machinery to fit the job, whether it's logging, land clearing, off-shore drilling or heavy material handling in some distant wilderness. If your problem needs a solution as big as those we build for other people, we'd like to help. Let us hear from you.

R. G. LeTourneau

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me to be a very expensive method. A 2 x 2 x ½ in. steel plate or a plate of any other size needed and as many Nelson hooked studs as required to develop anchorage strength would give the same results at less cost.

Ivan L. Pfalser
*Caney, Kan.*

## Wrong Architect Named

Sir—In your Sept. 5 issue we were pleased to note an illustrated article about our sun-louver installation on the 400 Beverly Building here in Beverly Hills (p. 28).

We wish to advise you that it was designed by architect John C. Lindsay, of Los Angeles, whereas you gave credit for the design to John C. West.

H. R. Hanson
*Sales Promotion Mgr.*
*Lemlar Mfg. Co.*
*Los Angeles, Calif.*

Editor's Note: Mr. Hanson is right.

## Not Quite So Big

**California's $11.8 billion water plan is grandiose, but not quite so big as indicated in ENR June 20, p. 24. It will involve not 736 reservoirs, as reported, only a mere 376.**

## CALENDAR

**American Association of State Highway Officials,** annual convention, Conrad Hilton Hotel, Chicago, Ill., Nov. 18-22.

**National Construction Industry Conference,** 3rd annual conference, Congress Hotel, Chicago, Ill., Dec. 4-5.

**Building Research Institute,** adhesives and sealants conference, Shoreham Hotel, Washington, D. C., Dec. 4-5.

**The Asphalt Institute,** annual meeting, New York Athletic Club, New York, N. Y., Dec. 4-5.

**Created Trends in Structural Design,** Armour Research Foundation, Illinois Institute of Technology, Chicago, Dec. 11-12.

**Highway Research Board,** annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 6-10.

**American Road Builders Association,** annual meeting, Sheraton-Park Hotel, Washington, D. C. Jan. 20-23.

**American Society of Heating and Air-Conditioning Engineers,** annual meeting, Penn-Sheraton Hotel, Pittsburgh, Pa., Jan. 27-29.

**National Bituminous Concrete Association,** annual convention, Flamingo Hotel, Las Vegas, Nev., Feb. 3-6.

**Association of Asphalt Paving Technologists,** Sheraton-Mt. Royal Hotel, Montreal, Canada, Feb. 17-19.

**American Congress on Surveying and Mapping-American Society of Photogrammetry,** 1958 consecutive meetings and co-exhibit, Shoreham Hotel, Washington, D. C., Mar. 23-29.

# The No. 12's part in a good team job

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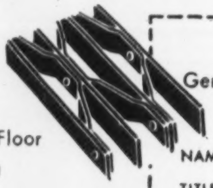

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ENGINEERING NEWS-RECORD
Vol. 159, No. 20 November 21, 1957

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*Back issues of* ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 50¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

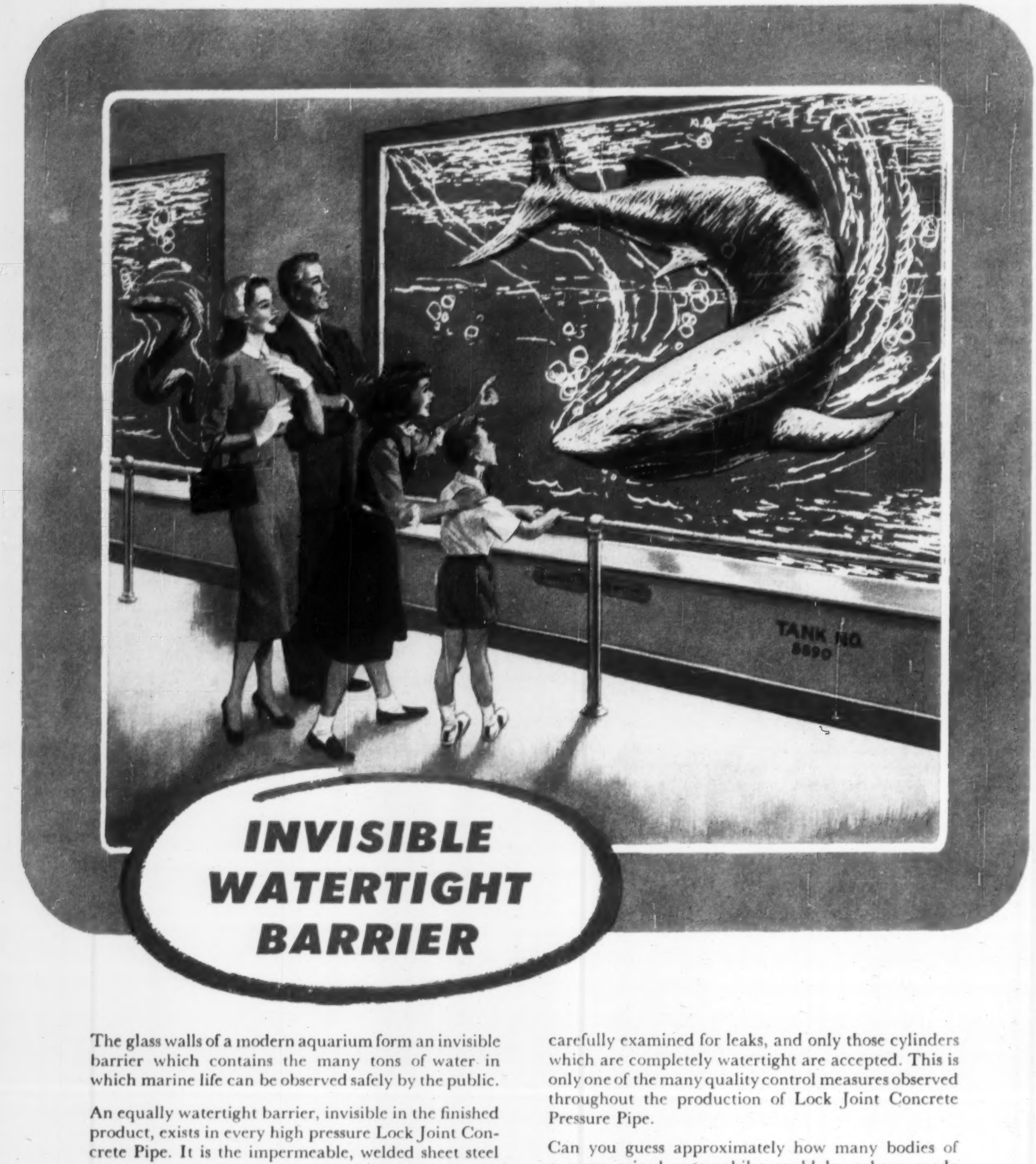
# THE CONSTRUCTION WEEK

**END OF THE LINE**—A land-buying scandal that for a time resulted in the cut-off of all federal funds to the State of Indiana came to an end in an Indianapolis courtroom last week, with the conviction of two out of four highway officials indicted. Convicted were Virgil W. Smith, former chairman of the State Highway Commission, and Robert A. Peake, an attorney. Nile Teverbaugh, former commission right-of-way chief, and Harry Doggett, former land buyer, were cleared. The case grew out of the purchase of two lots in Indianapolis needed for right of way for the planned Madison Avenue Expressway. The men were charged with buying the lots from original owners for $3,000, then selling them to the state for $25,800 (ENR May 16, p. 24).

**HOUSING STARTS FIGURES NOT ACCURATE**—Figures of the Bureau of the Census indicate that new home starts in nation over the past 10 years are more than 10% greater than reported in the monthly and annual government summaries of nonfarm housing construction issued by the Bureau of Labor Statistics. But home-builders are not disturbed by the disparity in the figures because they and economists, say that the BLS figures accurately reflect the trend.

**PUZZLING FAILURE**—Collapse of a concrete dome roof under construction for a 4 mg water tank in Melrose Park, Ill., has investigators stumped. The falsework appears to have been to blame, but it was a standard design for this type of dome, used many times before. The circular dome, seated on a 30 ft concrete wall, was to be 150 ft in diameter and 4 in. thick. The whole dome had been formed, an 8 ft band along the ring girder had been concreted and concrete was being placed for an adjoining 8 ft band, when a 16 x 100 ft section fell, killing one man and injuring eight others.

**BROKEN SEWER CREATES CRATER**—A break in a 72 in. sewer in Seattle, creating a pit 60 ft deep, 120 ft wide and more than 200 ft long, led to a decision last week to construct a by-pass line around the cave-in at a cost of $200,000. City construction crews at first attempted to drive sheetpiling to form a shaft down to the sewer line which is 145 ft below ground, but gave this up as rains caused new cave-ins. Attempts to keep the line open below the break were only partially successful. The break is in the north trunk sewer, largest in the city. More than 30,000 persons live in the area above the break. The sewer break is believed to have occurred years ago, perhaps in the earthquake of 1949. It softened an area near the pipe and sucked earth into the sewer. Over the years, the cavity probably grew larger and larger until the surface collapsed into the hole.



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# WASHINGTON OBSERVER

- **Bigger military construction coming**
- **Carpenters head for Capitol griddle**
- **Curtiss leaving roads job**
- **On the Seaway: No 1958 tolls**

- **Non-military federal construction faces a slashing (page 23). But all is not bleak for the building industry.**

  In the new shift of emphasis, toward catching up with Russia in the new round of the arms race, you'll be seeing some heavier construction outlays in certain military areas. Budget decisions are still being made, but here's where new construction expenditures most likely will come:

  **Intermediate missile bases** in allied nations ringing the Soviet. The Administration is setting great store on these, will move with speed.

  **Dispersal of Strategic Air Command bases** both here and abroad, to give the Communist world, in event of attack, no big targets such as Pearl Harbor.

  **New housing, runways, etc. for our radar network**—the early warning lines stretched across the Russian path to America from the north.

—

- **The gigantic International Brotherhood of Carpenters may furnish the next big headlines for the Senate's McClellan committee.** Chairman John McClellan's committee on labor rackets has subpoenaed records of the 750,000 member union and its president, Maurice A. Hutcheson. There's no hint yet of what Senator McClellan or his counsel, Robert Kennedy, are looking for, or when they'll call union members before them in hearings.

  Mr. Hutcheson appeared before another Congressional committee last summer—on a highway right-of-way scandal in Indiana—and invoked the Fifth Amendment. Presumably, Senator McClellan has in mind a broader field for questioning now.

  Another building trade union, the operating engineers, is under investigation by the McClellan committee. Here again, the committee has given neither a timetable for hearings nor an outline of subjects it is inquiring into.

—

- **Charles Dwight Curtiss is retiring as Commissioner of Public Roads at the end of the year.** No successor to Mr. Curtiss has been appointed yet, but one is being sought. This reflects a reversal of the once-held view—of Federal Highway Administrator Bertram D. Tallamy—that the Bureau of Public Roads could operate effectively without a commissioner.

  Several prominent highway experts are reported to have turned down the job. Roads people, inside and outside the bureau, say that Curtiss' stabilizing influence will be missed in execution of the federal highway program. In their opinion, Mr. Curtiss has played an important role in bridging the bureau's past, when it was a strictly non-partisan agency, and its present, in which it has become more of a political agency of the Administration.

—

- **There will be no St. Lawrence Seaway tolls in 1958.** Canadian and U. S. officials have agreed it would neither be fair nor practical to charge for use of an incomplete project. So, they'll use 1958 as a training period—for manifest study and recruitment of the personnel that will collect tolls once the Seaway is a finished, going project.

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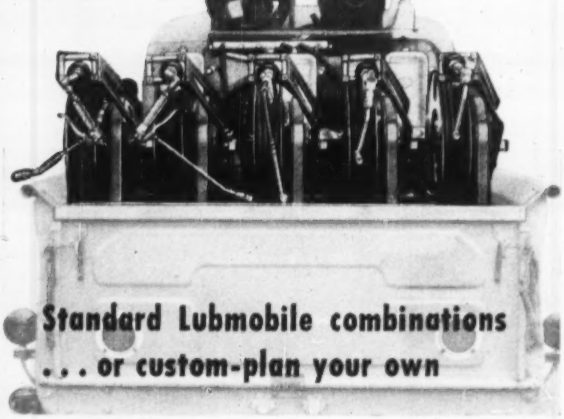

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NOVEMBER 21, 1957

ENGINEERING
NEWS-RECORD

# What's Happened to Interstate Roads?

**► The program is on schedule, but there's much confusion in reading the yardsticks.**

**► But it isn't producing contracts and equipment sales, as yet, in the volume anticipated by construction men.**

**► The answer lies in understanding the program, how it gets its money, how it is administered.**

E. E. Halmos, Jr.
**Senior Editor**

Despite a fog of confusion, conflicting opinion and some criticism, a study of the huge interstate highway program makes it very clear that the program is on schedule, as its proponents have insisted.

But to say that the program is on schedule requires a very careful definition of terms of reference. And in that definition of terms lies the answer to growing—and serious—criticism and concern over the program, its progress and the manner in which it is being administered. Contractors, engineers, manufacturers and public officials have been concerned that the program hasn't produced the business and the visible progress that they thought it would in the year and a half since the program became part of the nation's laws.

These are the facts:

- Obligations of money for use on the interstate system—money that will definitely be spent on the roads in some way in the immediate future—are so nearly on schedule that no criticism is valid. Total obligations now top $2.3 billion—within a few millions of estimates.
- The program is unbalanced—from a geographical point of view. For this reason, some states are doing what appears to be a very great amount of work, others virtually nothing.
- A very heavy proportion of the initial funds obligated—$862 million so far—is going into preliminary engineering and right-of-way acquisition.
- Many manufacturers, contractors and engineers have badly misread the basis and the effect of earlier estimates of what the highway program would mean in terms of equipment, materials and construction capacity.
- Nearly everyone—both the construction industry and the general public—has failed to appreciate the meaning of some of the sections of the highway law itself, of spending, and the method of apportionment of funds for the first three years.
- Nearly everyone has been confused by the multiplicity of reports on various phases and sections of the program—reports that cannot be taken alone without understanding what they represent—to the point that the whole program gets lost behind a vast and impassable screen of unrelated statistics.

• **Measuring sticks**—There are many possible ways to measure the progress of the highway program—by apportionment of funds to the states, by apportionment of funds within the states, by mileages completed, by contract totals, and by obligations.

All of these yardsticks are useful. But only one of them presents a figure that can stand alone to tell the story. That figure is the Bureau of Public Roads' total on "obligated" funds.

It is necessary to define this term, as used by BPR, and to differentiate it from the others being loosely used.

A glossary of terms applying to the interstate highway program money would read this way:

**Apportionment**: The assigning to a state of its share of the federal funds approved by Congress. In effect, this is the opening of a line of credit for the state, to be drawn upon for future use, with the concurrence of the BPR.

**Programing**: The earmarking of a portion of the state's apportionment, for a specific project—but a project that need not be built immediately.

**Obligation**: The actual authorization by BPR, approving a state-drawn "check" for a stated amount of money from the apportionment.

• **How it works**—It works this way:

After the passage of the Highway Act of 1956, BPR apportioned the funds provided by Congress for the first three years to the 48 states. The apportionment was made on the long-standing formula of area, population and post-road mileage.

Thus, a state might have been notified that a $10 million line of credit was available to it, for use on its interstate roads. Before it can write "checks" on this money, however, the state's engineers must first "program" their work—decide upon an orderly plan of development, general road locations, and approximate costs. These costs are then marked "programmed"—earmarked, that is, for specific projects. But no money has been spent.

Next step is to get necessary engineering work done, for exact route locations, interchanges, design and placement of structures. For this purpose, the state now gets approval to "obligate" a fixed amount to pay a consulting engineer. Later, the state may obligate an added sum to pay for right-of-way. Still later, the remainder of the fund originally earmarked may be obligated, when contract letting is about to begin.

Thus the total that BPR reports under the heading of "obligation" is in fact a series of definite commitments of funds for a definite purpose. And these funds will certainly be spent within a reasonable period.

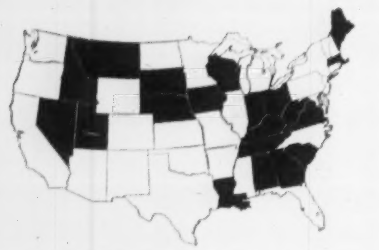
• **Geographical unbalance**—From these definitions, and from the fact of the method of apportionment under the formula of area, mileage and population, flows the reason for the geographical unbalance of the program at this time.

And it raises a further caution flag in reading even the "obligation" totals.

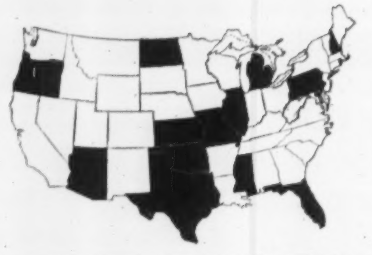
When the Highway Act was signed into law in July 1956, some of the states were far more ready for it than most of the others. Thus, New York and California—with revolving funds for advance purchase of right-of-way, and much advance planning; Maryland, with a 12 year highway program already planned and started; Michigan and a few others could reach up to their engineering shelves and pull down already completed plans—in some cases even to right-of-way acquisition—and go to work. Other states were well along in planning, at least. But many had made no plans at all, or at least very few—for a variety of reasons that includes politics, lack of engineering personnel, lack of funds.

So the big new program got going—and is still going—first and strongest in the states that had the staff, the plans,

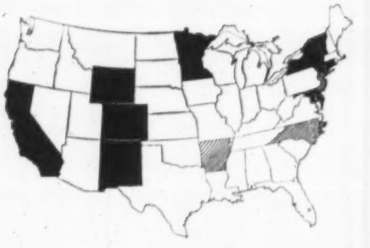
# . . . Distribution of work is unbalanced



**TWENTY STATES** have let fewest contracts, though planning goes full tilt.



**FIFTEEN STATES** have let contracts up to 50% of their fund apportionment.



**NINE STATES** are approaching the 100% mark. (Shaded states unreported.)

and the money. Most of the rest had to begin the process at the beginning—start planning.

The method of apportionment, too, has a lot to do with where the program has started up, and where it seems to be far behind. Under this method—which, importantly, takes no account of need—some states got far more money than they could use, some far less. For example, Delaware, Montana, Rhode Island and Colorado received over 40% of their total needs as their apportionment in the first three years. Nevada got 62%. But New York and California got something like 15% of their total needs for the same period.

The result is obvious. For New York and California to use up roughly 5% of their total apportionment in each of three years has been a relatively simple task just on the basis of plans already available. For Nevada to use up 20⅔% of its total 13 year apportionment in each year is a colossal task.

Thus any attempt to rate the states by trying to set up a percentage of obligations to apportionment can be badly misleading.

• **Other costs**—Another fact that must be taken into consideration in any estimate of the progress of the highway program is the relatively high proportion of the funds that have gone into engineering and right-of-way costs.

This is deliberate, it should be noted. According to Highways Administrator Bertram D. Tallamy, the bureau has recognized that these two points were the greatest potential block to rapid progress of the highway program itself, and emphasis has been placed hard to get these problems under control.

The percentage is impressive—37½. Breakdown in the first year and four months of the program (to Nov. 1 of this year) is this: Total federal funds obligated, $1.9 billion, of which $514 million went for right-of-way, $201 million for engineering. The percentage will drop in later years.

Thus, only 62½% of the federal funds obligated were set up for actual construction.

• **Where's business?**—These facts now provide an answer to the question that's loomed largest in the mind of every segment of construction:

Where's the business? Where did everybody go? Why are consulting engineers still waiting for some of the expected flood of work to come their way? Why are contractors in Boston and New York hardly aware of any effect of the new program? Why are bid prices dropping on the Pacific Coast? Why did a recent earthmoving job in Georgia come in for as little as 17 cents a yard?

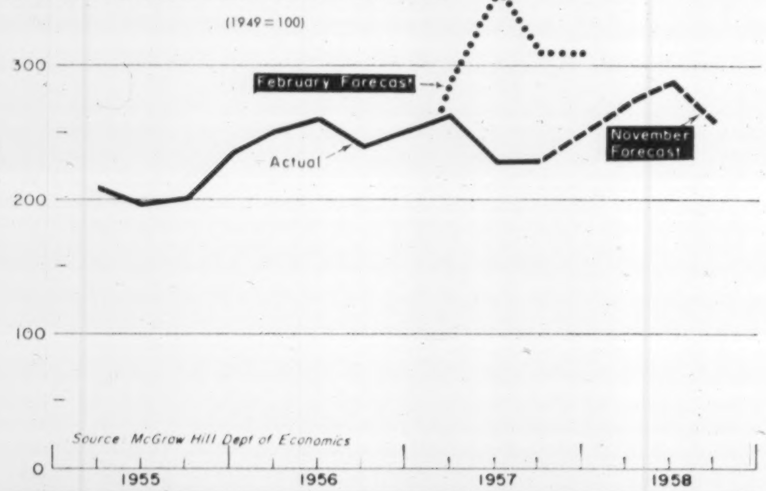
The answers can be deduced clearly. The manner in which the program got under way and is still going has put the greatest amount of work into the states where there are greater concentrations of well-equipped contractors and engineering firms. But this work is itself relatively small. Some 5% of the total program in New York State, added to an already great normal volume, is hardly noticeable.

But Montana, Idaho, Washington, still have a great deal of planning, engineering, right-of-way to do. Construction contracts haven't been ready—and won't be for some time yet. So in those states and many others there either isn't actually any more work to bid on than normal—or so little more that it doesn't make much difference.

So it is entirely possible for the program to be running on schedule—but for specific parts of the U.S. to see little of it right now. In about two more years, BPR thinks, things should be on a more even keel, countrywide. It still takes about 21 months from first suggestion to working plans for a road—and many of the states have had to catch up on that period, before they can go into construction contracts.

• **Machinery**—As to the disappointing

## Construction Machinery Makers Trim Their Estimates of 1957 Orders



Source McGraw Hill Dept of Economics

**MANUFACTURERS TRIM** their sales to meet actuality (see also page 107).

sales of machinery to build the highways (reflected in the accompanying chart) it is quite apparent that the manufacturers, as well as the contractors, have been as confused as everyone else as to how the program is proceeding and why.

Worse, all concerned have obviously misread the early reports on the program and its implications in terms of work to be done and equipment needed. And many have acted on the results of the misreading.

It is necessary to review: Much of the thinking of the construction industry and its suppliers has been based on the really monumental work of four task forces appointed by the American Road Builders Association late in 1954.

At that time, there was no interstate highway plan in being—it was under consideration by a Presidential committee. And that committee was talking in terms of a 10 year program, that would involve a total of $101 billion.

Such a program would represent an enormous increase in the then-booming construction industry, and the task forces set out to discover whether the industry could support it.

It is important to note the task forces' objective: Find out what the industry **could** do under such a forced draft, and what it would need in the way of materials and equipment under such a program. Not what it **would** do—what it **could** do.

On this basis, then, ARBA's committees had to think in terms of a highway program of the magnitude of $10 billion in the third year of the program—and many a manufacturer and contractor leaped off from this assumption. In highway construction it is an acceptable estimate that for every dollar's worth of contract, the contractor will need 50 cents worth of machinery. Thus, a $100 billion program would mean $50 billion worth of machinery. Except that:

Construction machinery doesn't wear out so fast that all the equipment in the contractors' hands would have to be replaced immediately on the start of the new program—so the replacement would in fact stretch out over the whole term of the program; also not all of the $100 billion would go for roadbuilding.

ARBA tried very hard—in its initial task force reports and in later revisions—to make clear on what basis the tabulations were made up. But many read only the headlines, not the print.

Of course, when Congress finally enacted a bill in 1956, it called for a 13 year program, not a 10 year one. And the further requirements of the trust fund will stretch the program another two years beyond that. So, although the total to be spent on roads remained at $100 billion (all programs lumped together), half again as much time had been added.

Over 15 years, then, replacement of equipment would work out to an average of about $3 billion a year (allowing for the part of the $100 billion that will go for right of way and engineering). And the normal replacement of construction machinery each year is already about $2.3 billion, much of which already goes into road work. The actual increase then, might be handled by existing or only slightly expanded manufacturing capacities.

- **Trust Fund**—Little public attention was paid, as the 1956 Highway Act was being hammered out, to the so-called "Byrd amendment" that established the program as a pay-as-you-go venture.

But the effect of the trust fund will be controlling on funds made available to the states each year, despite the amount of funds that Congress set up. Under the "Byrd amendment," the BPR cannot apportion any more to the states in any given year than is actually estimated to be in the fund, regardless of whether the law itself directs that more than this amount be apportioned.

Because of this stricture, in fact, cost estimates on the program have no direct meaning. Regardless of whether costs are increasing, only the amount of money in the fund can be apportioned—even if it is buying less actual road. Where the continuing cost checks will be important is as a guide to Congress in the final years of the program. If, say, in the 10th year, it appears that only

## How the States Have Progressed With Their Interstate Highway Programs

Bureau of Public Roads figures in thousands of dollars—First 15 Months Ended Sept. 30, '57

| | BPR HAS APPORTIONED THIS MUCH TO THE STATES for the first 3 years † | STATES HAVE . . . | | OF PROJECTS ALREADY PROGRAMED, STATES HAVE OBLIGATED THIS MUCH FOR . . . | |
|---|---|---|---|---|---|
| | | . . . Not Yet Programed * | . . . Already Programed | . . . Preliminary Engineering and/or Right-of-Way | . . . Construction Contracts |
| **Alabama** | $102,394 | $57,599 | $44,795 | $11,312 | $18,302 |
| **Arizona** | 56,657 | 19,802 | 36,855 | 7,816 | 7,995 |
| **Arkansas** | 78,249 | 31,416 | 46,833 | 19,913 | 7,418 |
| **California** | 404,238 | 98,148 | 306,090 | 190,482 | 105,024 |
| **Colorado** | 71,472 | 27,605 | 43,867 | 9,984 | 22,780 |
| **Connecticut** | 52,474 | 26,157 | 26,317 | 1,437 | 22,130 |
| **Delaware** | 33,287 | 27,740 | 5,547 | 5,017 | 530 |
| **Florida** | 87,218 | 47,236 | 39,982 | 7,695 | 14,737 |
| **Georgia** | 121,580 | 77,919 | 43,661 | 16,504 | 6,582 |
| **Idaho** | 52,464 | 36,432 | 16,032 | 2,884 | 4,662 |
| **Illinois** | 240,636 | 64,744 | 175,892 | 63,488 | 72,883 |
| **Indiana** | 123,670 | 102,513 | 21,157 | 15,250 | 365 |
| **Iowa** | 111,485 | 43,879 | 67,606 | 12,574 | 19,741 |
| **Kansas** | 90,576 | 34,978 | 55,598 | 9,721 | 10,837 |
| **Kentucky** | 97,092 | 60,594 | 36,498 | 23,669 | 3,449 |
| **Louisiana** | 85,478 | 51,375 | 34,103 | 12,241 | 4,829 |
| **Maine** | 40,742 | 33,412 | 7,330 | 1,304 | 2,378 |
| **Maryland** | 62,650 | 15,236 | 47,414 | 12,333 | 27,758 |
| **Massachusetts** | 109,843 | 51,858 | 57,985 | 4,660 | 28,101 |
| **Michigan** | 182,756 | 74,895 | 107,861 | 21,566 | 40,385 |
| **Minnesota** | 116,409 | 48,850 | 67,559 | 40,443 | 19,674 |
| **Mississippi** | 84,456 | 29,734 | 54,722 | 8,595 | 32,674 |
| **Missouri** | 136,774 | 70,840 | 65,934 | 21,425 | 43,288 |
| **Montana** | 74,367 | 54,962 | 19,405 | 15,270 | 2,843 |
| **Nebraska** | 75,168 | 62,120 | 13,048 | 4,868 | 6,584 |
| **Nevada** | 52,636 | 21,697 | 30,939 | 3,863 | 3,535 |
| **New Hampshire** | 34,289 | 16,003 | 18,286 | 3,414 | 8,267 |
| **New Jersey** | 114,625 | 71,950 | 42,675 | 21,278 | 20,027 |
| **New Mexico** | 59,478 | 25,683 | 33,795 | 2,776 | 29,496 |
| **New York** | 387,118 | 113,973 | 273,145 | 75,547 | 175,754 |
| **North Carolina** | 131,670 | 79,624 | 52,046 | 10,436 | 26,290 |
| **North Dakota** | 57,424 | 32,557 | 24,867 | 1,541 | 9,483 |
| **Ohio** | 224,883 | 38,451 | 186,432 | 47,941 | 84,154 |
| **Oklahoma** | 94,860 | 36,939 | 57,921 | 8,724 | 18,257 |
| **Oregon** | 66,313 | 33,612 | 32,701 | 5,566 | 19,680 |
| **Pennsylvania** | 281,389 | 111,534 | 169,855 | 32,114 | 104,987 |
| **Rhode Island** | 31,746 | 12,646 | 19,100 | 8,101 | 10,718 |
| **South Carolina** | 70,744 | 37,700 | 33,044 | 3,714 | 8,457 |
| **South Dakota** | 60,235 | 30,348 | 29,887 | 4,291 | 7,990 |
| **Tennessee** | 117,824 | 41,752 | 76,072 | 29,592 | 4,257 |
| **Texas** | 284,790 | 159,017 | 125,773 | 4,044 | 112,007 |
| **Utah** | 46,377 | 33,891 | 12,486 | 3,906 | 674 |
| **Vermont** | 34,119 | 19,890 | 14,229 | 7,878 | 6,351 |
| **Virginia** | 106,912 | 27,609 | 79,303 | 18,181 | 14,365 |
| **Washington** | 82,650 | 43,430 | 39,220 | 8,971 | 23,102 |
| **West Virginia** | 64,781 | 26,546 | 38,235 | 5,565 | 0 |
| **Wisconsin** | 120,795 | 81,270 | 39,525 | 19,263 | 11,018 |
| **Wyoming** | 52,719 | 11,168 | 41,551 | 3,817 | 26,119 |
| **Dist. of Col** | 33,259 | 13,950 | 19,309 | 7,410 | 5,637 |
| **U. S. Total** | **5,303,771** | **2,371,284** | **2,932,487** | **878,384** | **1,256,574** |

*** Federal funds only** **† Includes states contribution of 10% of total cost except for portion not yet programed (see column 2)**

## . . . Road program: Here's what's happened

36,000 miles of road will be built with the total available funds provided in the 1956 act, Congress may extend the program and the trust fund to get the planned 41,000 miles built.

As of now, the trust fund is performing remarkably well in providing the money needed. As of the end of September 1957, the Treasury reported that a total of $2.082 billion had been paid into the fund. Estimated receipts for that period were $2.096 billion—so close, in economists' opinions, as to be a negligible difference.

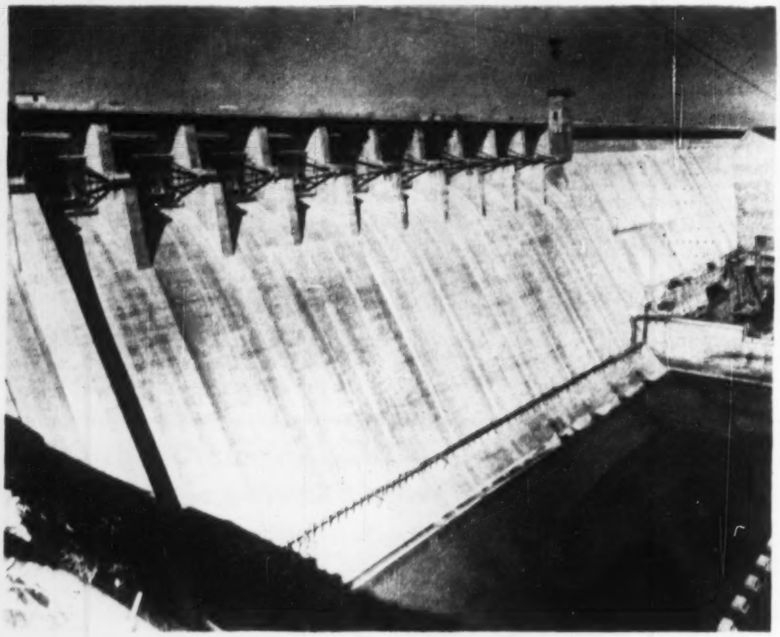
**• In sum**—Totaling up, then, the picture comes clear this way:

November 1, a total of $2.3 billion had been obligated by the states, almost exactly on the mark with estimates on which BPR is working. How close the estimates have been here is also clear—for the first year of the program (July '56 to June '57), estimated obligations were set at $1.4 billion. Actual obligations were $1.383 billion. For the present fiscal year, the estimate was $1.7 billion. To date, about $850 million has been obligated.

As of Nov. 1, a total of 2,576 "project miles" on the interstate system were under contract or under construction—but these project miles, it must be remembered, may not mean actual miles of completed road. A majority of the contracts, in fact, are for such items as grading, clearing, culverts and structures and the like.

Some of the states are far out ahead in obligating their funds, others haven't caught up by quite a big margin.

But in perhaps two years, the program will be going everywhere—dirt moving, pavement going down.



Main contract is 97% completed with nine months to go as . . .

## Table Rock Dam Is Winding Up on Schedule

With nine months yet to go on a $24 million contract, Morrison-Knudsen Co., Inc., and Utah Construction Co. have the concrete and earth dam structures 97% complete at Table Rock Dam on the White River in Missouri.

About 50 cu yd of concrete still are to be placed in the 1,600 ft long concrete section of the dam, which already contains 1.2 million cu yd. Earth extension at the north end of the dam is almost complete and contains 2.9 million cu yd of material; embankment at the south end will be placed early in the spring. The 10 radial type spillway crest gates have been installed and are being painted.

The powerhouse at the dam, which will contain four 50,000 kw generators, is about 50% complete, and expected to be completed by May 1959.

Table Rock Dam already has done flood-control work in April and May of this year when excessive rains poured 2 million acre-ft of water into its reservoir. This caused a rise of 160 ft and sent water a foot over the spillway.

## 190 Foot Nuclear Power Sphere Is Going Up Fast

The "equator" ring of a 190 ft dia Hortonsphere for the Dresden nuclear power station near Chicago has been completed. The huge steel sphere, to enclose 3.6 million cu ft of space, will house the atomic reactor at Commonwealth Edison's $45 million station.

A 100 ton derrick with 170 ft mast and 135 ft boom, mounted on a 210 ft tower, is erecting the sphere. Major work on the pressure vessel was begun June 12 and is scheduled for completion early in 1958, according to the builder, Chicago Bridge & Iron Company.

## Texas Puts Big Money Behind Its Water Program

Texas' water resources picture brightened considerably in the last two weeks. On top of statewide voter approval of a $200 million loan fund for water resources construction two weeks ago, a special session of Texas legislature last week authorized the State Board of Water Engineers to prepare a master water plan for the state. And the lawmakers provided a healthy sum of money for the job—$1.2 million.

The new water bill sets up a planning division in the State Water Board, to be headed by a $10,000 a year engineer with five $9,000 a year chief assistants. In addition to master planning of projects, the new division will also conduct research on underground water, evaporation control and the like. The bill also authorizes the board to undertake preliminary negotiations for storage space in federally planned reservoirs, with final decisions reserved to the legislature.

As now approved, $100 million in bonds can be issued by the state without further legislative action. The second $100 million in bonds can be issued after approval by two-third majorities of both branches of the state legislature.

# Sputnik, Muttnik to Crimp Public Works

## Congress and the Administration will aim to boost defense spending without increasing the debt limit

Domestic construction programs are going to pay a good share of the cost of stepped-up spending for defense. That is what the White House was planning at the beginning of the week as its Budget Bureau outlined the pattern of money requests to go up to Congress in January in the President's budget message.

A conflict of interests has to be reconciled in the Administration's spending plans for fiscal 1959 (starting next July 1). Everybody—including the President and the Defense Department's controller, Asst. Secy. Wilfred McNeil—has said that military spending will top this year's $38 billion ceiling. The only question is by how much. Minimum estimates are $1 billion to $2 billion.

Coupled with this rise in defense expenditures, the Administration is strait jacketed by its own objective of holding total federal spending within this year's limit of $72.8 billion or not much more. If at all possible, the White House wants to avoid puncturing the $275 billion federal debt ceiling fixed by Congress—although this wish appears less and less feasible.

On the other side, the President hates to curtail domestic programs—and the politicians are with him in that feeling, especially in an election year. But the White House dislikes a deficit even more, and the decision now crystallizing is to take the extra cost of defense out of federal civil works and similar programs for fiscal 1959. Whether Congress will concur is a question that cannot be definitely answered for another six or eight months.

However, ever since Sputnik I went aloft, the pressure has been on the civilian agencies to curtail their 1959 spending schedules. Even before that, they were on notice from Budget Director Percival Brundage to hold overall spending down to current 1958 levels.

Agencies responsible for domestic programs—flood control, rivers and harbors, reclamation, national parks and urban renewal—generally report that budgeting got tighter and tougher "every time the mutt in Muttnik barked." And the people in the Budget Bureau say privately that we haven't seen the end yet, things are going to get even tighter and tougher for domestic programs. All of the civilian agencies are gloomy, hoping for the best but resigned to budget cuts.

The Interior Department's official line for reclamation, as quoted from Asst. Secy. Hatfield Chilson in a Phoenix Airport interview (He was leaving the National Reclamation Association convention) is this, "There is no reason but to believe that the budget will provide for reasonable progress" on the reclamation program.

Off the record, though, reclamation people are anything but hopeful. They think budget cuts will put a crimp not only on new starts but also on current continuing construction. There will be no shutoff or slowdown in payments on contracts already awarded or to be awarded in the 1958 program, so far as is known now, but there will be no money for additional new starts in fiscal 1959.

Reclamation this year got $180 million of $199 million asked for by President Eisenhower. In fiscal 1957, the appropriation was $194 million. The Upper Colorado fund, however, received $25 million in 1958 as compared with $13 million in 1957.

With big jobs coming along like Trinity and Glen Canyon, for which a $107 million prime contract was awarded seven months ago, more money than this year would be needed for normal scheduled progress on the reclamation program next year. But present signs point to a budget hold-down to this year's level or less.

### • A 20% Cut for the Corps?

A steep cut is being talked of for flood control and rivers and harbors construction of the Corps of Engineers. Capitol Hill reports place this reduction as much as 20% below the 1958 appropriation.

Army Engineers don't know yet how deep the cuts are going to be in their requests for civil functions money. But they expect missiles et al to get money that will be taken out of civil programs in order to hold the total down.

This year the Engineers got $636 million, a little more than the $632 million the President requested. In 1957, they received $637.5 million. The Administration now is expected to ask much less than 1958, with no money for new starts.

President Eisenhower still has $200 million of authorized funds that could be allocated for urban renewal grants to cities. When he allocated $250 million in August, the President said he would consider releasing more if needed this year.

Urban Renewal Administration officials and housing chief Albert Cole have not made any formal request for additional allocations yet. But the money left in the kitty is not enough to meet applications from the cities through the next 20 months, to June 30, 1959.

Applications keep pouring in at a high rate, if not an increasing rate. More funds will have to be asked for next year if urban renewal is to continue to make capital grant reservations on incoming applications.

Urban renewal people admit that the requests from the cities will run higher than the Administration feels it can finance under a tight budget ceiling, with more money going to defense.

A compromise involving a cut is looked for—even though the capital grant reservations are merely commitments for future payments to the cities. They do not call for expenditures in the year the reservation of funds is made.

### • Public Housing Fares Worse

Public housing may get even shorter shrift than urban renewal. It is common speculation in Washington that the President is likely to ask for no new public housing starts in fiscal 1959.

This year, the Public Housing Administration picked up an authorization of 35,000 new units for the twelve months ending June 30. This is the second and final half of a two-year authorization for 70,000 new starts that Congress approved in 1956.

Actually, failure to enact more public housing starts for fiscal 1959 would not seriously crimp the program, except as a threat to activity beyond the end of that year, June 30, 1959. PHA now has a backlog of 80,000 units under contract with local public housing authorities, waiting to go into construction. Various factors—high costs, site problems, red tape, etc.—are delaying these local projects. The contracts are firm, however, with no time limit on starting construction. In addition, PHA has 31,500 units that can be placed under contract until June 30, 1958. And it has 35,000 good until June 30, 1959.

Even if Congress deferred action until the 1959 session, it could still extend the program and vote additional units to keep public housing alive, but the Democratic-controlled Congress that comes back in January will hardly wait that long. The 1958 session may be expected to approve some additional public housing starts, if only to reassure local authorities that the future of the program is safe.

## *Engineering News-Pictures*

## Highest Dam Calls for Celebration

Completion of the world's highest dam, 780 ft Mauvoisin, in southwest Switzerland two weeks ago, caused its builders to shoot off fireworks in celebration. Of arch type, containing 2.8 million cu yd of concrete, Mauvoisin is 181 ft thick at the base, 45 ft at the crest and 1,760 ft long. A hydro power project, Mauvoisin was described in ENR May 24, 1956, p. 34.

→

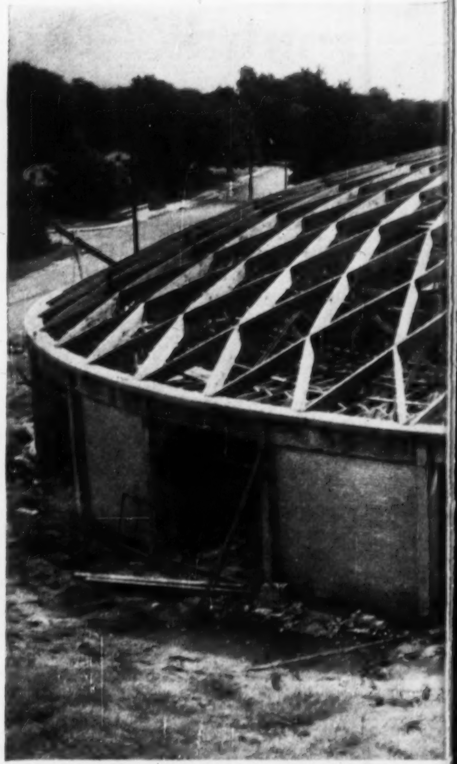
## 275 Foot Lift Span Floated Into Place

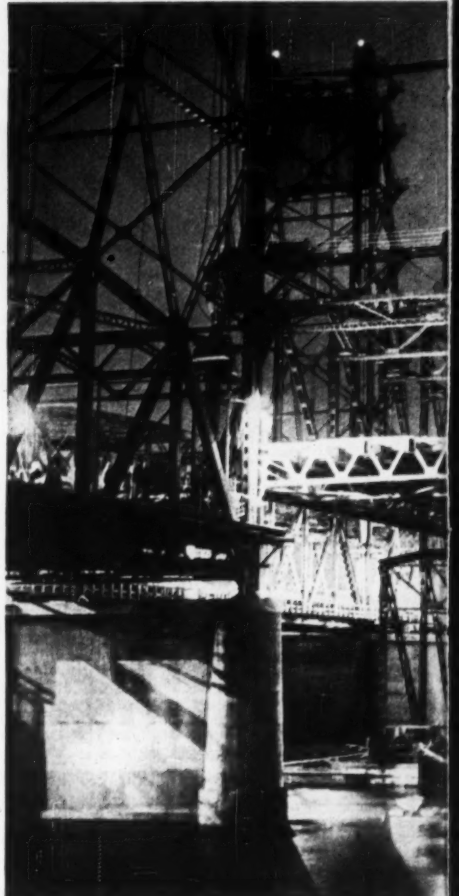
The lift span of the new Interstate Bridge over the Columbia River between Portland, Ore., and Vancouver, Wash., was floated into position and settled onto its supports during the early morning hours of Oct. 8 to take advantage of favorable winds and tides.

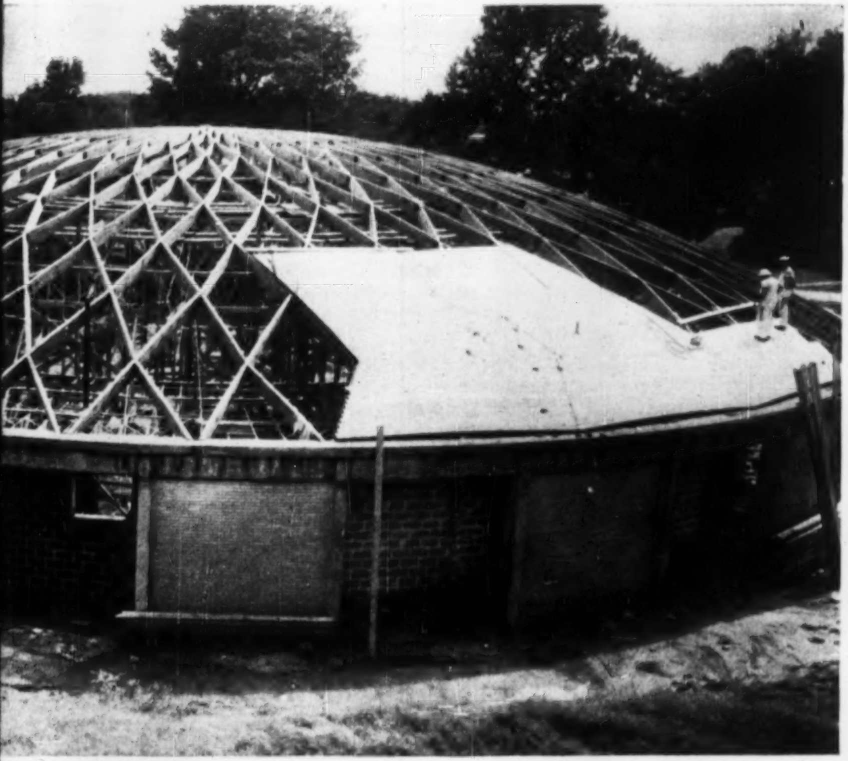
The 420 ton, 275 ft long span was built atop a half section from another part of the bridge. It was floated out and placed on temporary supports.

At 3 a.m. the river was closed to traffic for eight hours. Only 8 in. of tide drop was used in setting the span onto the supports. Additional settlement was gained by reducing the buoyancy of the barges.

Contractor for the $6.7 million bridge is Guy F. Atkinson Co., Portland, Ore. Steel erection was done by Judson Pacific-Murphy Corp., Emeryville, Calif.







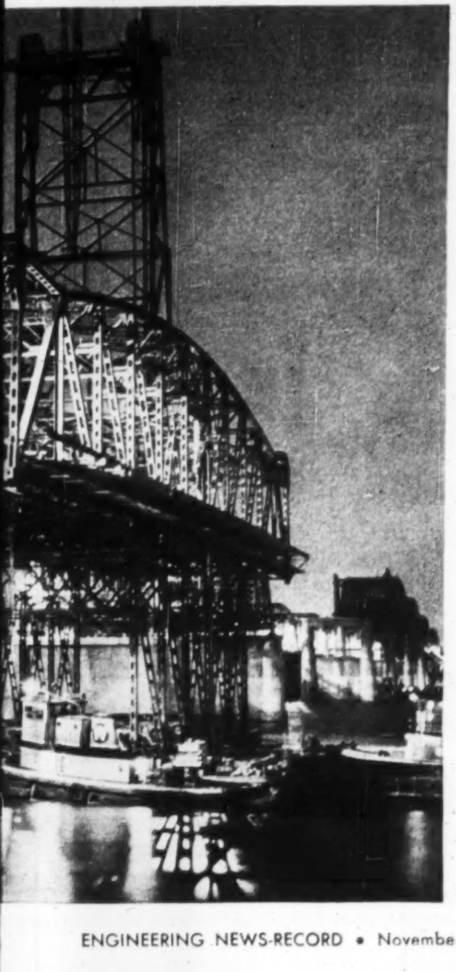
## Open-Grid Wood Dome Spans 140 Feet

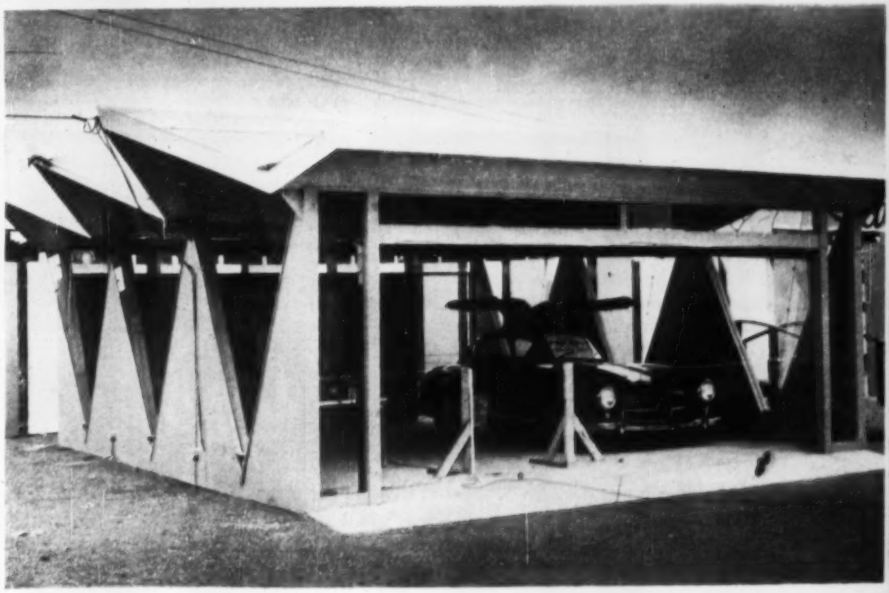
An open-grid wood dome spans 140 ft over the new Pine Hills recreation center in Memphis. It is believed to be tops in diameter for such frames.

The dome has a spherical radius of 140 ft and a rise at the crown of 18½ ft. Its framing members are Douglas fir pieces ranging in cross-section size from 4 x 16 in. at the perimeter to 2 x 12 in. at the crown. The frame is sheathed with southern yellow pine.

Radial thrust of the dome is contained by a 16 x 27 in. reinforced concrete tension ring, which encircles the structure at the top of the columns.

The dome was designed and fabricated by Roof Structures, Inc., Webster Groves, Mo. It was erected by Steel & Roof Structures, Inc., Memphis. Architects of the $150,000 building were Mann, Harrover & Williams; consulting engineers, Merrill & Mann; and contractors, W. F. Jameson Construction Co., all of Memphis.





## Wood Folded Plates Roof a Small Garage

A Detroit builder who says he wanted to get away from the ordinary in small garage construction has on display an unconventional model with a wood folded-plate roof. So far the 20 x 40 ft exhibit structure has convinced four buyers, even though the price is $3,500-$2,000 more than the company's cheapest standard garage.

The roof is constructed of 4 x 8 ft sheets of ½ in. plywood on a frame of wood two-by-fours. Sections were built on the ground and then raised into place. Sufficient rigidity was built in—partly by using steel gussets in the valleys—to obviate any need for tie members.

Architects Pirscher & Havis, Ferndale, Mich., made the design for Fairway Construction Co.

# Ruling Has Teeth?

## Freeze on groundwater use in New Mexico to be tested

New Mexico's state water engineer, Steve Reynolds, last week rejected the City of Albuquerque's application to drill four wells in the Rio Grande underground water basin. The city promptly announced it would challenge the action in court.

About 11 months ago, Mr. Reynolds, acting under a 1931 state law, declared a vast 8,500 sq mi section of the Rio Grande Valley an underground basin (ENR Dec. 27, 1956 p 23). The declaration froze water use in this area at present levels, placed all well drilling under the state engineer's strict control, and required large (municipal and industrial) water users to purchase water rights attached to irrigated land and retire them as a condition for future heavy withdrawals of underground water.

Albuquerque gets all of its municipal water from wells. City officials challenged Mr. Reynolds' authority and announced they would not retire water rights in the drilling of new wells. To bring the controversy to a head, the city filed an application with the state to drill four new wells.

Water engineer Reynolds cited two reasons for rejecting the city's application:

- Granting it would "impair existing rights to the use of the waters of the Rio Grande."
- The city "has failed and refused to take the necessary steps to offset the adverse effect upon the rights of water users from the Rio Grande."

In a memorandum accompanying the rejection order, Mr. Reynolds wrote: "The fact that withdrawals from the underground water reservoir in the Albuquerque area will diminish the surface water supply and will adversely affect prior existing rights to the surface flows of the Rio Grande is fully recognized in the 'Report of the Special Water Planning Committee, Albuquerque, 1951.'

"Groundwater withdrawals from the Rio Grande underground reservoir will materially reduce the groundwater accretion to the Rio Grande and its tributaries by flattening the hydraulic gradient of the reservoir toward the stream, if the withdrawals are large and long-continued, thus reducing the surface water supply.

"If the withdrawals are sufficient, large and long-continued, the hydraulic gradient will become reversed and the river or the constructed drains will contribute water to the underground reservoir, with a resultant further reduction in the surface water supply."

Albuquerque City Commission Chairman Maurice Sanchez said that the state engineer's order creating the underground basin has discouraged industry from coming into Albuquerque. "It can have no other effect," he said. "One of the first questions a prospective investor asks is about the adequacy of our water supply. What choice does he have when he's told we can't even drill the wells we need?"

As to the requirement that the city retire existing water rights to offset new wells it wants to drill, Mr. Sanchez asked:

"What rights does Mr. Reynolds expect us to retire? Rights already in the city? In Bernalillo? On productive farm land that the owner refuses to give up? It's easy to talk about these things, but applying them is a different matter."

# Bosporus Bridge Contract Goes to D. B. Steinman

The long-discussed intercontinental bridge over Bosporus Strait at Istanbul, Turkey will be designed by an American engineer. Announcement has been made that a contract has been signed by the Turkish government awarding the design of the suspension structure, with a 2,214 ft main span, to D. B. Steinman, consulting engineer of New York City.

The negotiations with French interests to construct the bridge, and take payment in Turkish bonds, guaranteed up to 80% by the French government (ENR Oct. 31, 1957, p. 17), are reported to be continuing. In the meantime, the contract for design has been separately executed on a cost plus fixed fee basis in U. S. currency.

The project covered by the contract is 2½ miles long, with the bridge proper (main and side spans) occupying 4,900 ft. Included also are about 1½ miles of approach highway and five interchange structures. A vertical clearance of 164 ft under the main span will provide for the passage of international shipping.

The location of the bridge near the northern outskirts of Istanbul will be on an alignment recommended by De-Leuw, Cather & Co., consulting engineers, Chicago, in a report made to the Turkish government about a year ago.

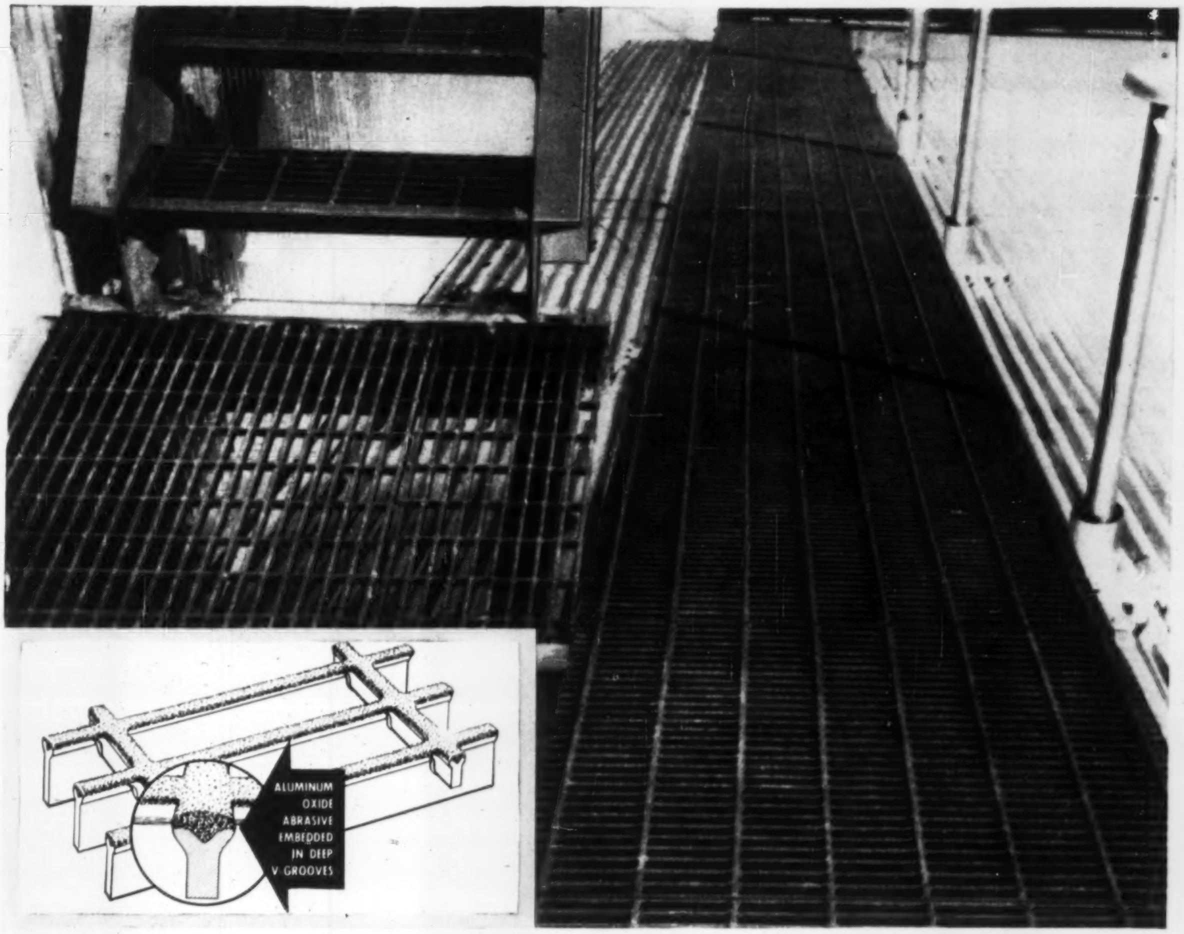
# Atomic Energy Headquarters Dedicated

President Eisenhower recently dedicated the new $13.3 million headquarters building of the Atomic Energy Commission located near Germantown, Md.

Under construction since the spring of last year, the building will be ready for occupancy by 1,500 employees in January. Completion of another wing (shown under construction in background) for 300 more employees is expected by next September.

Of reinforced concrete construction (ENR Dec. 22, 1955, p. 20), the building has four stories plus basement. Including space in the uncompleted wing, floor area will total 576,000 sq ft.

Voorhees, Walker, Smith & Smith, New York City architects-engineers, designed the project. John McShain, Inc., of Philadelphia, built the completed wings. Contractor on the last wing is John A. Volpe Construction Co., Malden, Mass.



# RELGRIT® provides safe footing on sharply sloping roofs at AEC St. Louis Plant

Reliance Relgrit gratings and treads are providing safe access to stacks, filters and other equipment across the 18° sloping roof of the AEC Feed Material Plant near St. Louis. The abrasive surface of Relgrit was picked as a truly non-skid surface for ramps, stairways and walks leading to equipment which had to be serviced frequently.

The top surfaces of the bearing bars have $\frac{1}{8}$" deep V-grooves in which is embedded aluminum oxide abrasive grains in a hard resin. The material is not affected by water, oil, gasoline, greases, or the most commonly used acids, alkalis and other chemicals, which gives it a long service life under the most severe conditions. If you have operations in which the floors become oily, greasy, wet, or slick from any other cause, Relgrit can provide safe footing at very low cost. Write for complete information and samples.

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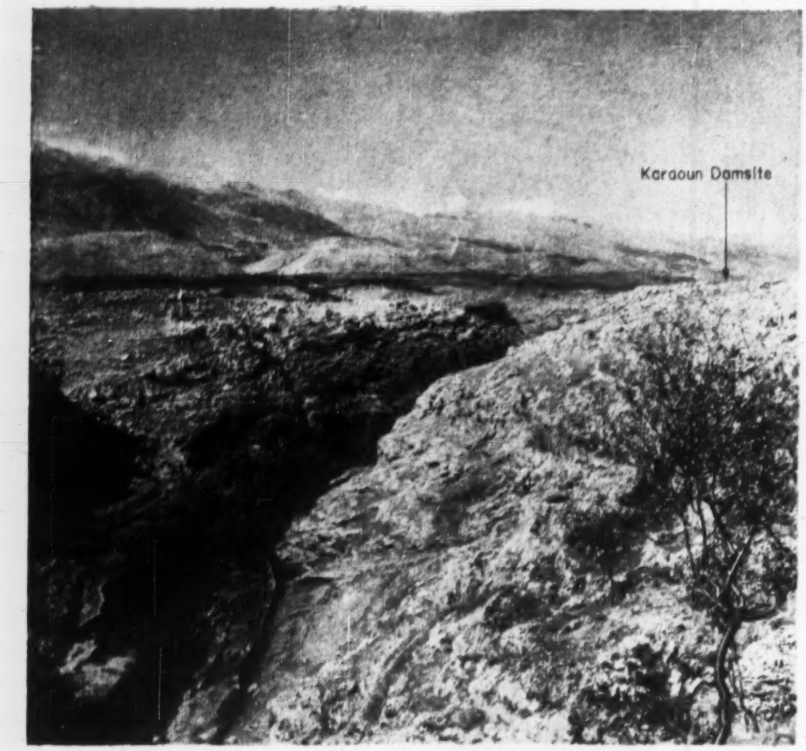
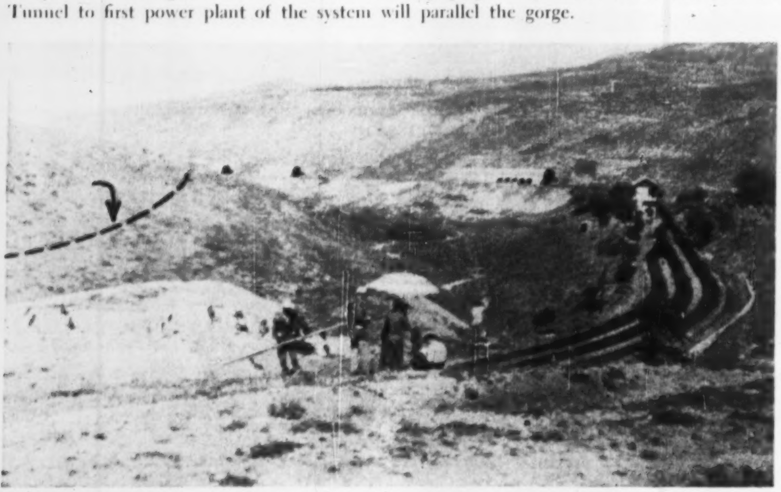
# Little Country With Big

TURKEY
IRAN
MEDITERRANEAN SEA
SYRIA
Beirut
LEBANON
IRAQ
ISRAEL
JORDAN
EGYPT
SAUDI ARABIA

MIDDLE EAST GATEWAY, Lebanon is small but important and influential.



**FIRST DAM** for Lebanon will impound waters of Litani River in lower Bekaa Valley for power and irrigation. River enters this deep gorge a few miles below the damsite. Tunnel to first power plant of the system will parallel the gorge.



**NEW MOUNTAIN HIGHWAY,** of modern divided lane construction, is planned to cross Lebanon to the Syrian border. Here, surveying crew investigates an alignment (arrow) parallel to the railway. Note concrete snowsheds in the distance.

Waldo Bowman, Editor
Engineering News-Record

In the Middle East, little Lebanon exercises an influence in favor of stability and progress that is often the cause for wonder. Yet there is nothing mysterious about this position nor subtle in the manner in which it has been achieved. The Lebanese planned it that way, and seem constantly thinking up new angles to make their influence more effective.

One of the most obvious of these new angles is to use construction to make their country more attractive to visitors (especially those with business to transact), and more productive and efficient for the home folks, who encompass races and religions as diverse as can be found living together in harmony anywhere in the world. A number of U. S. engineering firms occupy prominent positions in this construction drive, and U. S. contractors continue to exhibit an interest in it although they find the competition rough.

From ancient times a gateway to the Middle East, and thus enjoying a geographical advantage, the Republic of Lebanon, and particularly its capital city, Beirut, is now, in addition, becoming a show window and shopping center where its less advanced and more landlocked neighbors can see, and buy, the products of the West. Moreover, by adhering to a policy of neutrality between the Arab and Western worlds, Lebanon, time and again, has served as an effective balance wheel in Middle East politics.

One enters Beirut through a fine, modern airport and is driven for perhaps 15 minutes over a modern, divided lane boulevard into the heart of the city, but still is not prepared for the modernity—and plentiful new construction—that bursts forth on every hand. Sao Paulo in Brazil comes to mind, so does Caracas in Venezuela and, in some respects Mexico City. But to encounter a modern booming city in the troubled and underdeveloped Middle East is a somewhat startling—and welcome—sight.

Office buildings and hotels are going up in nearly every downtown block. On what was the edge of town two years ago, 8- and 10-story apartment buildings are being massed in veritable colonies. If the buildings were all of the same architecture, these colonies might be reminiscent of some of our large U. S. public housing developments. But they are at the other end of the scale of uniformity. The architects and the owners of these buildings proclaim themselves as individualists,

# Construction

each striving for public attention, while they build for private investment.

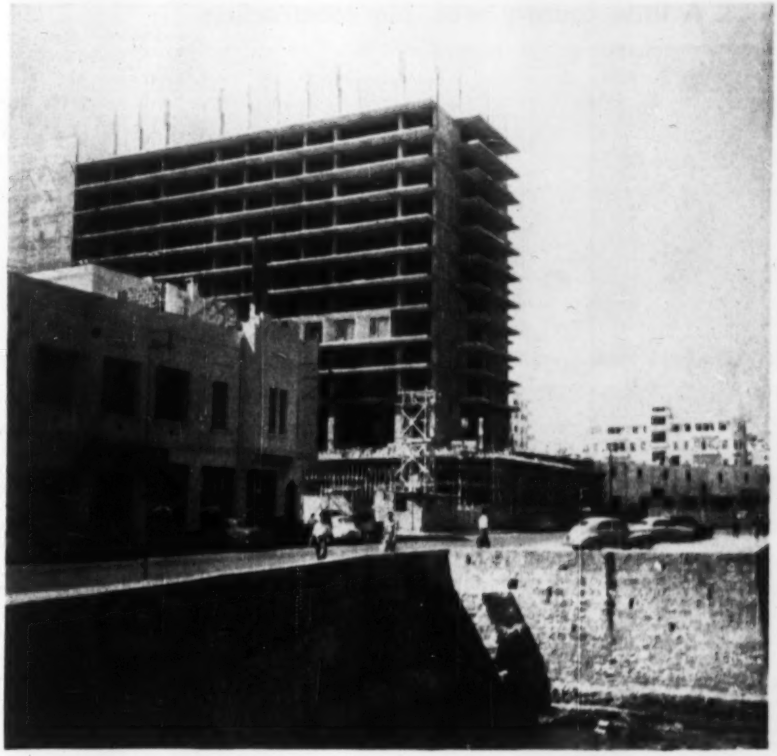
And as one delves further into what is going on, many other examples of modern development come into focus. There is a water supply that runs safe and pure from every faucet. Old buildings are coming down, not only to be replaced, but to make way for wide streets.

The first section of a four-lane divided superhighway skirting the picturesque Mediterranean coast northward from Beirut to Tripoli was opened in March. Designed by the U. S. consulting firm of Tippetts, Abbett, McCarthy, Stratton (TAMS), it now is being joined to the new Beirut streets and at the same time being pushed farther northward. The same consultant is busy now on the surveys for a similar road eastward to the mountain resorts and on across Lebanon's bread basket, the Bekaa Valley, to the Syrian border on the way to Damascus.

Of even deeper significance is the Litani River project in the Bekaa Valley, where dammed up waters will provide hydro power and then irrigation for presently underproductive, coastal lands. The first contract, for seven miles of tunnel, was let in August to an Italian-French construction combine.

Water figures, too, in one of the important projects of the U. S. Operations Mission to Lebanon (Point Four), which is to develop well supplies for the country's isolated villages. And, finally, there are operations heading up in Lebanon which relate to other areas of the Middle East. One of these, in which a U. S. consulting firm, Brown & Blauvelt, is active under the name of International Research and Exploration Group (IREX), is a study of rehabilitation possibilities of an old and unused railroad connecting Damascus in Syria to the Moslem holy city of Mecca in Saudi Arabia. Bids for construction on this job were asked Oct. 10, with contract award scheduled for Jan. 31, 1958.

**• Where the money comes from**—Capital for all this activity comes from both public and private sources, and a good deal of it is foreign capital because Lebanon has limited resources of its own. The U. S., under Point Four, has provided several million dollars annually since 1953 to match Lebanese funds in a cooperative program encompassing environmental health, school planning, agricultural improvements and water resources. But the investment of private funds from abroad in Lebanon improvements far exceeds public monies.



**TALLEST BUILDING,** among Beirut's many new ones, will be the Phoenicia Hotel, American designed and American owned. Solid wall construction in front facade is for earthquake resistance. Similar construction is used at the rear and in a center bent.

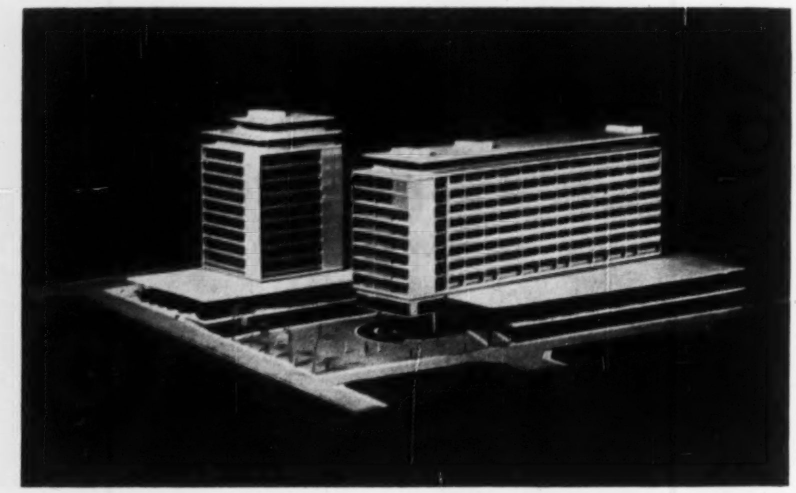
Much of this comes from the oil-rich sheikdoms to the East whose wealthy merchants and emirs see in Beirut a safe haven and a good investment possibility for their idle funds. The ownership of many of the new hotels and apartment houses can be traced to these sources. But it also is notable that the largest hotel, the Phoenicia, is to be owned in large part by the Intercontinental Hotels Corp., a Pan American Airways subsidiary.

**• Why Lebanon attracts business**—The ancient Phoenicians, forefathers of the Lebanese, were great traders, and set up colonies throughout the then-known world. This heritage from trading still is being used today, but in a different way. Instead of going out after business, Lebanon is attracting business to itself. Beirut profited from the Suez crisis, which caused firms to transfer to it from Cairo, but the trend was under way long before that. Principal reasons are a liberal economic policy, completely unrestricted exchange of currency, a free port and a banking secrecy law that makes the city a safe repository for flight capital from uncertain regimes in various places.

Nearly 100 American firms have branches or offices in Beirut, and 32 of these were established last year. What do these firms and others of many national origins like about Beirut? Some like the climate. In the severest winter months you can take a dip in the Mediterranean and then climb 7,000 ft in an hour to go skiing. In the summer, the mountainside resorts are only 15 minutes away. Some like the schools, many of which are American, and all like the easy accessibility of the city by sea or air. There are no visa regulations and no restrictions on travel—except to certain border areas where there is nothing of attractive interest anyway.

The local people are trilingual—Arabic, French and English. Literacy is the highest in the Arab world—70% in the country as a whole and 90% in Beirut. There is freedom of the press and complete religious freedom—half of the population is Christian and half Moslem, and both are made to feel wanted and at home.

**• Nature of the building boom**—Most of the new buildings are offices and apartments, the latter including six new hotels. Nearly all are being built of reinforced concrete. A good many have cantilevered floors, all have louvered facades, glass is used extensively and so is color. Air conditioning is universal, with the result that the city is short of power and is building additions to its steam power plants while



**BLOCK SQUARE DEVELOPMENT** in Beirut, shown here in model, will include shops, offices, apartments and an underground garage. Known as Centre Urbain it will be the first Middle East development to utilize the concept of open space and roof gardens.

looking forward to the hydro power from the Litani project. Public buildings and banks also are being built in numbers, but in general they follow a more heavy and somewhat classical type of architecture.

Two of the commercial building projects are worth special mention—the Phoenicia Hotel and a two-building development of underground garage, shops, offices, apartments, and restaurants, a la Rockefeller Center. Actually the Phoenicia also has a two level underground garage in deference to the parking problem.

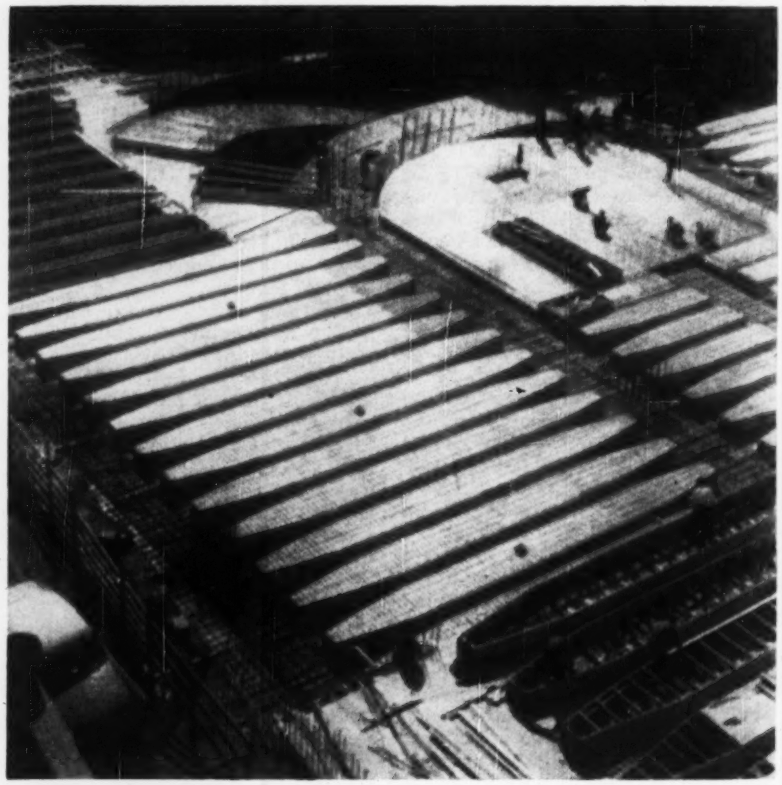
The Phoenicia, which Intercontinental Hotels took over after the original promoters ran into difficulties, will be the tallest building in Beirut—14 stories. Of reinforced concrete, it consists of a 2 story base, about 300 x 300 ft, out of which rises a 12 story tower, about 75 ft wide and 200 ft long. A feature of the layout is that the hotel lobby will be on the second floor level reached by escalators, while the ground floor will be devoted to shops along the front, service areas in the rear and a combination theater-ballroom in the center. The theater and ballroom can be used separately, or in combination for conventions and exhibits. An outdoor pool also will be installed on the roof of the low part of the building, on the same level as the hotel lobby.

Designed by Edward D. Stone, architect, with Gorlis & Atlas as structural engineers and Peter Bruder as mechanical engineer—all of New York City—the building is structurally unusual, partly because Lebanon is an earthquake prone country. The tower bents,—three bays, 20, 30 and 20 ft center to center of columns—are given extra rigidity by the columns being about twice as large transversely as they are longitudinally. Also, solid shear walls, continuous from foundation to roof, are used in the outside bays of the end bents, and also near the center of the tower.

Smooth surface ceilings being a requirement, and beam and slab floors offering a structural advantage, spaces between beams are filled with lightweight concrete blocks. Also to comply with the smooth ceiling requirements, some of the transverse girders in the tower bents had to be heavily reinforced to achieve a sufficiently shallow depth.

Something of the same problem was encountered on the two-building development mentioned above, which will be known as the Centre Urbain Starco, where the requirement was that the floor system not exceed 24 in. in depth. This meant a 4 in. slab and 20 in. beams, and for some of the floors in the basement garage and the lower story shops, which were designed for 180 psf floor loading, the beams had to be widened at the ends to secure the section necessary. This was accomplished by flaring the forms as shown in one of the accompanying illustrations.

Centre Urbain is arranged on three-quarters of a plot 400 x 300 ft, the remaining land not being available for purchase. The two buildings, disposed as shown in the accompanying view of a model, will be 12 stories high, with the



**FLOOR CONSTRUCTION** for Centre Urbain development involves forms which provide flared-end beams to furnish enough section to satisfy a 24 in. depth limitation. Curved ramp in background is entrance to underground garage.

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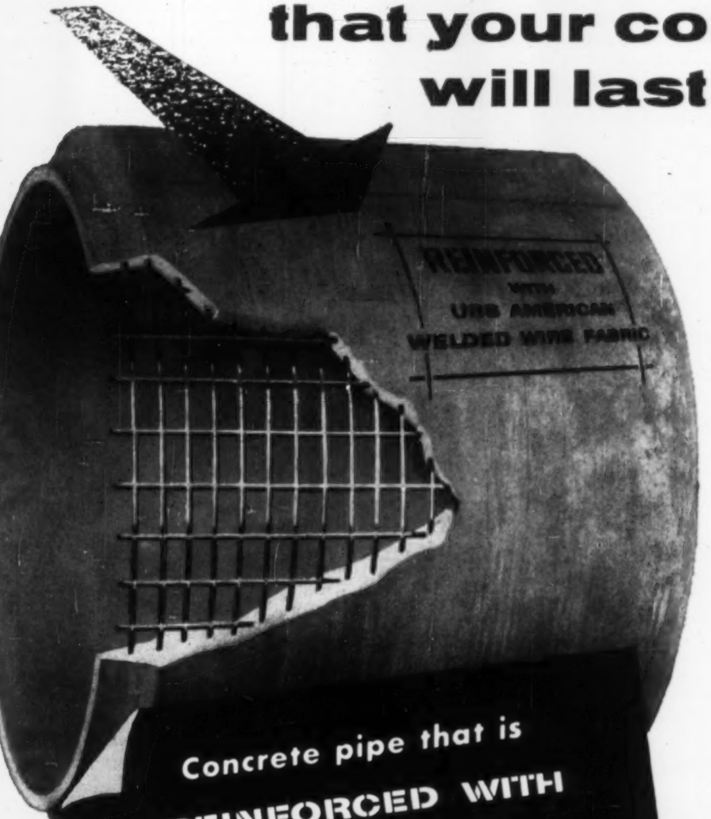

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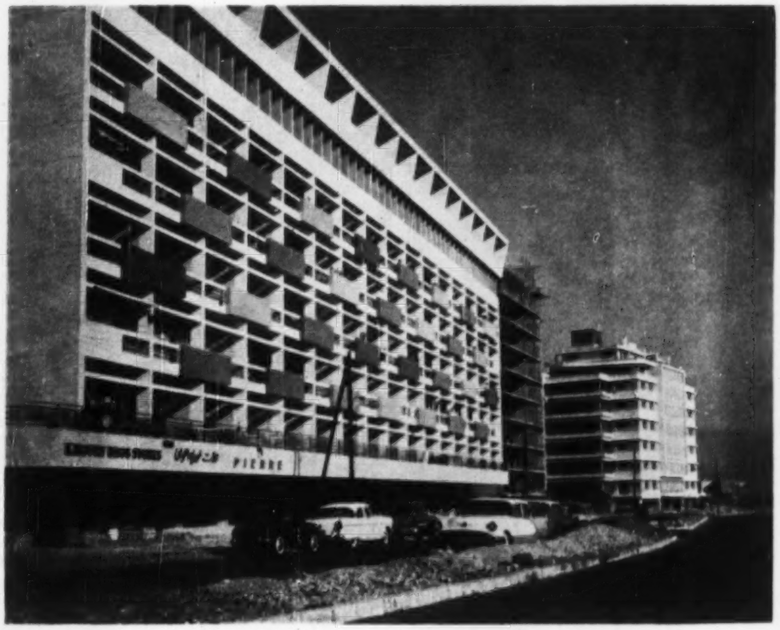
## . . . A little country with big construction



**BIERUT'S APARTMENT BOOM** is dotting the city with striking structures. On this one, the panels along the balconies are in various bright colors.

lower two floors, larger than the tower sections, occupied by shops. The area not covered by buildings will be landscaped in gardens and provide the entrance to the underground garage. The first four floors in the towers will be devoted to offices and the next four floors to apartments. There also will be a roof garden restaurant, and planting on the roofs of the shops.

The buildings have 23 x 50 ft c. to c. column spacing with the result that some of the beams are heavily reinforced. Spiral deformed bars are used for all sizes over ¾ in. diameter. For the present, only the smaller building will be completed to full height, the larger being stopped at the base of its tower. The Centre Urbain has been designed by Swiss architects and engineers, is being built by a Lebanese contractor, and is owned by a group of Beirut businessmen.

If these two building projects are somewhat more notable structurally than the many apartment houses, they will by no means outshine them in architectural appearance. The variety of facade treatment is especially striking.

Since half of the buildings in Beirut are less than 20 years old, these latest structures merely represent the present state of a trend which seems destined to continue with even more eye-catching examples.

How long it will continue would normally be questionable since there are vacant apartments in some of the new buildings because of the high rents that are asked. Lebanese construction circles, however, do not seem to be concerned, explaining their optimism on the ground that the type of ownership involved is that which wants to convert money into fixed assets, regardless of the immediate return. They feel that there is still lots of this kind of money around.

**• A mountain highway**–The topography of Lebanon consists of, from west to east, a ½ to 5 mile wide coastal strip, the Lebanon Mountain Range, the Bekaa Valley and the Anti-Lebanon Mountain Range along the Syrian border. The country's main west-east highway, connecting Beirut with Damascus, in Syria, and the rest of the Middle East has to cross this topography. Because of this and because the road serves the popular mountain resorts above Bierut and the towns and agricultural lands of the Bekaa Valley, it is the scene of bumper-to-bumper traffic both morning and evening. Something better than the present winding, 2 lane highway obviously is necessary.

**LIGHTWEIGHT CONCRETE BLOCK** stacked in place as fillers for a ribbed terrace floor in the Phoenicia Hotel will also serve as forms for the concrete of the ribs.

Lebanon is determined to provide something much better, and to this end has engaged Tippetts, Abbett, McCarthy, Stratton to survey and design a modern highway across the mountains. Since the summit elevation in the Lebanon Range is 5,000 ft, after which the road drops down to the Bekaa Valley floor at El 3,000 ft and then climbs up the Anti-Lebanon Range to 4,300 ft at the Syrian border, the job will be a major undertaking.

Surveys have proceeded far enough to develop the basic pattern to be followed. A 4 lane divided highway on entirely new location will be built from Beirut to the large mountain resort of Bhamdoun, a distance of about 15 miles. From there to Chtoura in the valley, 12 miles, two modern lanes will be built to supplement the present road, which will be replaced with another modern two lanes when traffic warrants. And finally from Chtoura to the border, 15 miles, the existing road will be improved.

Indicative of the major nature of the problems involved is one 5 mile stretch of the present road with a 10% grade, which it is desired to replace with a 4 lane divided highway having a 5% grade. The engineers finally have worked out a location where in 6 miles they can effect the necessary 1,650 ft rise, which gives them the required 5% grade, and without curves too sharp for fast moving traffic. But the cost will be $800,000 a mile. Overall, the road will probably cost in excess of $15 million.

To carry out this work, TAMS has 20 American engineers and 20 Lebanese assistants in its Beirut office as well as six 7-man field parties, each in charge of a U. S. engineer.

**• Water and power**–Since Lebanon has few natural resources it literally has had to live on trade. Now, however, it has hopes of improving its agriculture by irrigation and supplementing its commercial activities with some types of light manufacturing. These hopes reside in the Litani River development in the lower Bekaa Valley where a storage dam and a series of tunnels are planned.

First impetus was given the project back in 1951 when, under the Point Four program, a team of U. S. Bureau

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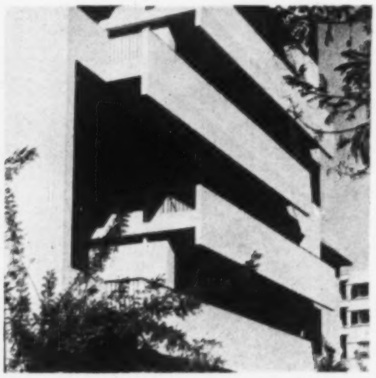


**T-SHAPED BALCONY MEMBER** serves a dual purpose—as a parapet for one floor and as a sunshade for the floor below.

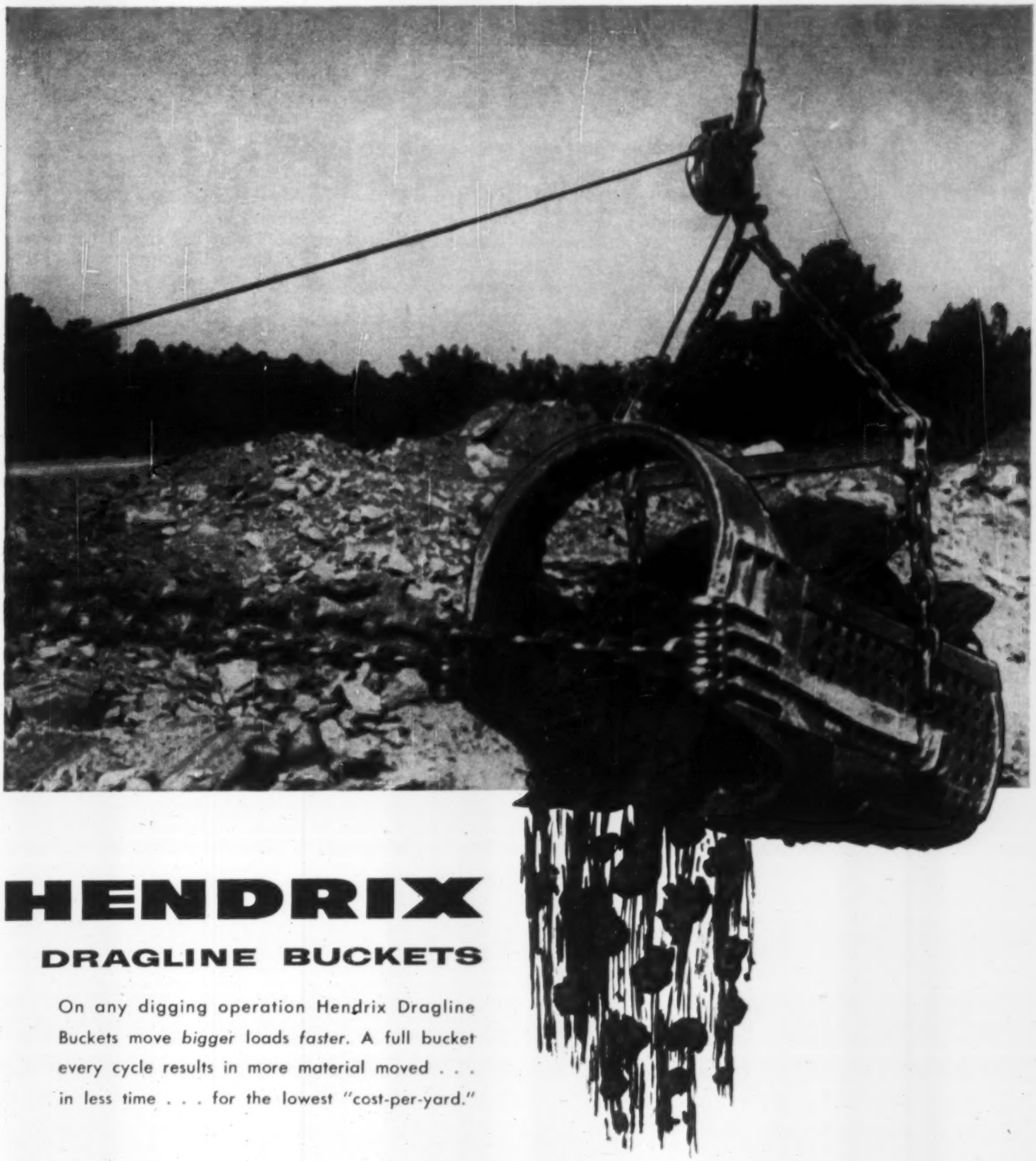
of Reclamation engineers undertook surveys and a preliminary design. Subsequently, the Litani Valley Authority was formed with the intent of selecting a foreign engineering firm to design the project, but this plan has been altered in favor of basic design by the Authority staff, and detailed design by a French consortium of consultants calling itself the Groupe Francaise du Litani. The first contract, for a 7 mile tunnel, was awarded in August.

Principal financing for the $45 million first phase of the project is provided by a $27 million World Bank loan granted in 1955 (ENR Sept. 29, 1955, p. 279). When the elements of the second phase are added the total cost will mount to $100 million.

The layout of the project, as presently conceived, is shown on the accompanying map and drawing. The key structure will be a long dam, probably a rockfill, on the Litani at the south end of the Bekaa Valley, just above where the river enters a narrow limestone gorge.

Water impounded by this dam at Karaoun will be carried in a 3 mile tunnel down the Litani Gorge to a power plant at Markabi, thence in a 10 mile tunnel through the Lebanon Mountains to another power plant on the Awali River from whence it will be diverted into an irrigation system to be built northward along the coast as far as Beirut. Later a 3 mile tunnel and another power plant will be inserted in the project between the Awali power plant and the irrigation takeoff.

The present Litani River project differs in several important particulars from the initial one which has received considerable publicity over the past several years, and which was described in the ENR article noted above. Fundamentally, the difference rests in the location of the tunnel through the mountain range. Under the initial scheme there was to be a 5½ mile



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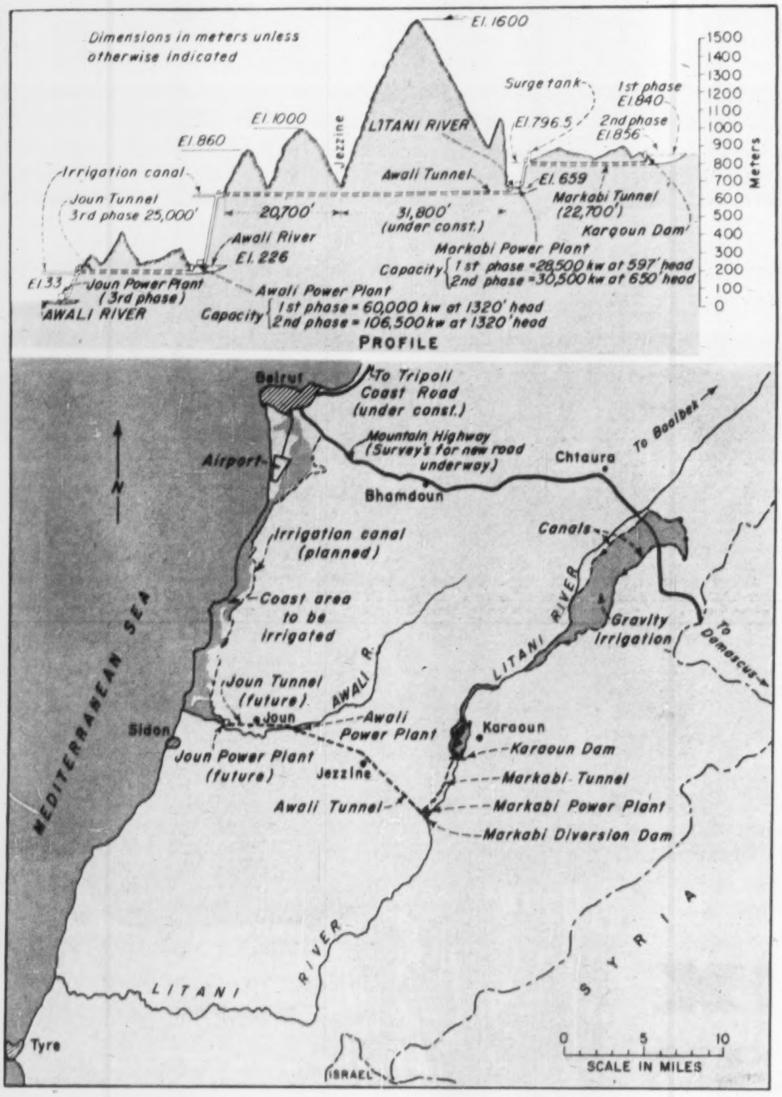

Dimensions in meters unless otherwise indicated
El. 1600
Surge tank
1st phase El. 840
2nd phase El. 856
El. 1000
El. 860
Jezzine
LITANI RIVER
El. 796.5
Irrigation canal
Awali Tunnel
El. 659
Joun Tunnel 3rd phase 25,000'
20,700'
31,800' (under const.)
Markabi Tunnel (22,700')
Karaoun Dam
Awali River El. 226
Markabi Power Plant
Capacity 1st phase = 28,500 kw at 597' head 2nd phase = 30,500 kw at 650' head
El. 33
Joun Power Plant (3rd phase)
Awali Power Plant
AWALI RIVER
Capacity 1st phase = 60,000 kw at 1320' head 2nd phase = 106,500 kw at 1320' head
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Meters
PROFILE
Beirut
To Tripoli
Coast Road (under const.)
Mountain Highway (Survey's for new road underway)
To Baalbek
Chtaura
Airport
N
Bhamdoun
Irrigation canal (planned)
Canals
Coast area to be irrigated
MEDITERRANEAN SEA
LITANI RIVER
Gravity Irrigation
To Damascus
Joun Tunnel (future)
AWALI R.
Joun
Sidon
Awali Power Plant
Karaoun
Karaoun Dam
Joun Power Plant (future)
Jezzine
Markabi Tunnel
Awali Tunnel
Markabi Power Plant
Markabi Diversion Dam
SYRIA
RIVER
LITANI
Tyre
ISRAEL
0
5
10
SCALE IN MILES

**LEBANON'S LITANI VALLEY PROJECT** comprises a dam in the Bekaa Valley and a series of tunnels through mountains to carry water for irrigation and power.

tunnel running from Karaoun reservoir northwest through the mountains to the Bisri River (upstream portion of the Awali) on which three power plants were to be located. The present scheme, in contrast, involves crossing the mountains in a longer tunnel several miles downstream from the reservoir. Also in this scheme, one power plant will be located on the Litani and two on the Awali.

Two principal reasons have been cited for the change—considerably more power can be developed and, at Markabi, the waters from some large springs can be added to the flow coming from Karaoun and thus augment the irrigation supply. It is known that the proposed tunnels are in an area subject to earthquakes and, possibly, to large underground water flows, but the Authority staff believes these conditions are no worse than on the initial location.

In any event, with the award of the first tunnel contract, this revised plan is now under way. This contract is for the first seven miles (from Markabi to Jezzine) of the 10 mile Awali tunnel, estimated to require the longest construction time of any of the elements of the project. The tunnel is at about 2,000 ft elevation and will be bored through fractured limestone. And since there are few opportunities to use adits, most of the tunneling will have to be done from the ends.

The group that was awarded the $9 million tunnel contract includes Impresa Astaldi of Rome and the Societe Auxiliare d'Entreprises Electriques et de Travaux Publics of Paris. Before the contract was awarded negotiations were carried on with five other foreign contractors including three from the U.S.—McLean, Grove & Co., New York City; Tecon Corp., Dallas, and Morrison-Knudsen Co., San Francisco.

Meanwhile, the Litani River Authority is considering offers from 15 foreign companies to construct Karaoun Dam. U.S. firms involved are Morrison-Knudsen, Tecon, and J. A. Jones Construction Co. of Charlotte, N. C. The estimated cost is about $7 million, and it is planned to award the contract before the end of the year.

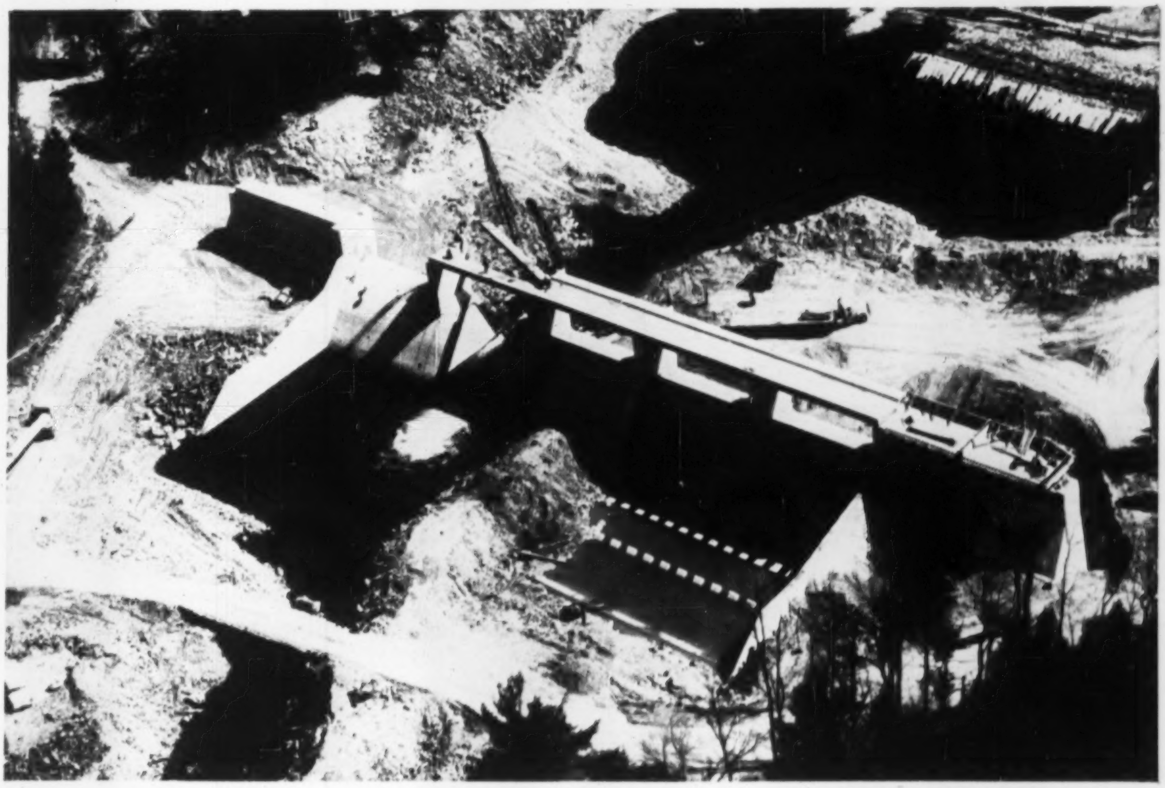
**• Other projects coming up**—Despite the activity in water development, building and highways, however—indeed because of it—Lebanon is continuing to study other needs that new construction can fulfill. Thus, even though its Beirut airport is now the largest and busiest in the Middle East, expansion plans are in the making for handling both more passengers and more freight. The port facilities also are being eyed for improvement, especially a third basin, more warehouses and an expansion of the free zone area to relieve present congestion. These improvements seem especially desirable to the Lebanese because Syria is building a harbor at Lattakia in an obvious attempt to free itself of dependence upon Beirut.

Looking forward to more power for industry, the Lebanon Industry Institute also has been formed to attract new manufacturing plants. With a joint Lebanese-American board of trustees, the Institute has set up model workshops and testing laboratories, and will conduct engineering and economic studies for individual companies interested in building plants in Lebanon.

And finally to attract more tourists, Bierut municipal authorities recently have taken bids for construction of a gambling casino (the only one to be permitted in the country), and have just completed a stadium and athletic plant hopefully called Olympic City. All this is in line with the realization that snagging more tourist dollars is one of the best ways to increase Lebanon's assets. With such star attractions as the Roman ruins in the north of Bekka Valley at Baalbek, Crusader castles along the coast, modern accommodations in Beirut and a good highway system, Lebanon is well equipped to make the tourist satisfied. Add this to satisfied business men, and Lebanon's growth seems to be reasonably well assured.

**The next article in this Middle East series will cover Iraq's extensive development program.**

# Look what you can do now with PRESTRESSED CONCRETE (VSM)*



Shown here are 44 ft. long AMDEK box-section prestressed concrete members being installed at Pocono Lake Preserve Dam, Pa. This is one of hundreds of installations of AMDEK members, originated and fabricated by American-Marietta Company, whose Concrete Product Division plants are strategically placed throughout the nation.

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Every day brings further proof of the wide acceptance of prestressed concrete as a **Versatile Structural Material*. Engineers and architects throughout the country, quick to recognize the economies and advantages it offers, are constantly finding new uses for it. As a result, precast, pretensioned members in standard cross sections are available in most localities today!

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It will pay to investigate the opportunities prestressed concrete offers. For data on tensioning materials and general information on prestressed concrete, write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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This oil well flow line to the tank battery is a typical Republic ELECTRUNITE Light Wall Grooved-End Tubing and Victaulic Coupling application. The Victaulic "Vic-Easy" portable grooving tool, left, weighs only ten pounds, can be operated manually or with power drive for the in-the-field adjustments.

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# ELECTRUNITE Grooved-End Tubing

## ...go hand-in-hand to serve your piping system needs

Save installation time . . . reduce operating costs with Republic ELECTRUNITE® Light Wall Grooved-End Tubing and Victaulic "Vic-Easy" method of coupling. This combination offers new operating efficiencies and maximum economies in temporary, semi-permanent and permanent piping system installations. Victaulic Couplings are produced by Victaulic Company of America, Elizabeth, New Jersey.

Republic ELECTRUNITE Grooved-End Tubing is designed and produced to meet severe requirements and laying conditions of road building contractors, the mining, petroleum, construction, tank truck and processing industries. Light Wall is lightweight—as much as one-third lighter than conventional steel pipe, and it is steel—strong, sturdy.

Republic ELECTRUNITE Grooved-End Tubing is produced with a consistent wall thickness at the grooved section . . . no weak spots in the system. Mechanical strength is maintained throughout the line and working pressures are adequate for movement of air and most liquids.

Joining is quick and easy—no threads to cut, no runs to turn. Simply use any of a variety of Victaulic Couplings and fittings—Snap-Joint couplings for lightweight and temporary applications; Bolt-Type for heavy duty and permanent installations. And Republic's Grooved-End Tubing can be used—then easily re-laid as the job moves ahead. When work is complete, simply dismantle and move to new job site. Because joining is simple and tubing is portable—maintenance is easy.

For additional information, send coupon or write today! It is available in sizes up to 4½" O.D. and wall thicknesses from .085" to .156". Available with a normal mill protective coating or with a protective hard drying oil. Also available in stainless steel.

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**Chicago architects turn the spotlight on . . .**

# Contemporary Steel Curtain Wall Design

Architects, engineers and builders centered their attention recently on steel curtain-wall construction in the Windy City. It was part of "Chicago Dynamic" week—"dramatizing that city's architectural heritage in a building renaissance that could make it the world's first contemporary city," according to some observers.

In a full-day "workshop" conducted on Oct. 29 at Chicago's Museum of Science and Industry, six prominent architects discussed the design, construction and economics of curtain walls used in their designs of an equal number of buildings. Five are now under construction in Chicago and the sixth has just been announced.

Moderator of the steel curtain-wall workshop was Geo. E. Danforth, chairman, Department or Architecture, Western Reserve University, Cleveland, Ohio. In introducing the six-man panel, he told his 200 listeners that, "the widespread commercial application of curtain wall in metal has been in effect in this country only since about 1946."

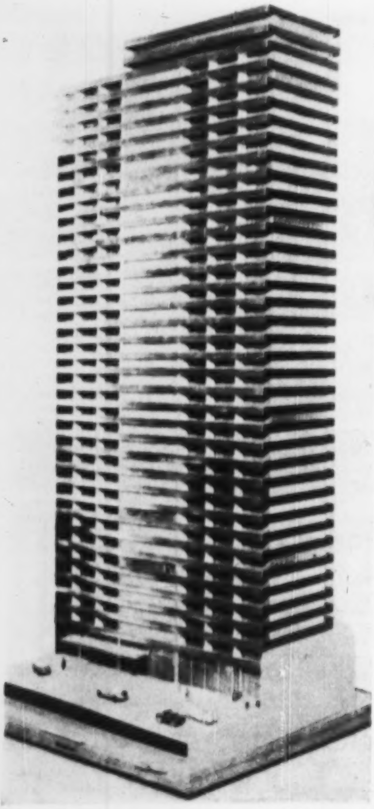
**ARCHITECTS** in Chicago heard Milton Male (with pointer) of U. S. Steel Corp., explain the operations of a cold-roll forming mill for producing steel wall sections.

Chicago is credited with being the birthplace of curtain wall construction, in 1883, which reduced exterior walls to thin "curtains." Before that time, Prof. Danforth said, building walls were load-bearing and of necessity had to be massive.

The six buildings under discussion are:

The 40 story Executive House—a unit of Condado Caribbean Hotels, Inc.—at 63 East Wacker Drive; the 22 story Borg-Warner Building, 200 S. Michigan Ave.; the 19 story 4100 Marine Drive Apartments; the 8 story Salvation Army Building, 860 N. Dearborn St.; the 6 story Mutual Trust Life Building, at Wacker Drive and Monroe St.; and the 5 story Morton Salt Building, 110 N. Wacker Drive.

Here, briefly, are some of the architectural considerations and design techniques of steel curtain-wall construction of the six buildings, presented by representatives of the architectural firms that designed them.



←

**• Executive House**—This 40 story apartment hotel, containing 448 air-conditioned units will be Chicago's tallest reinforced concrete building. It will rise to a height of 365 ft above ground level (ENR June 27, p. 39).

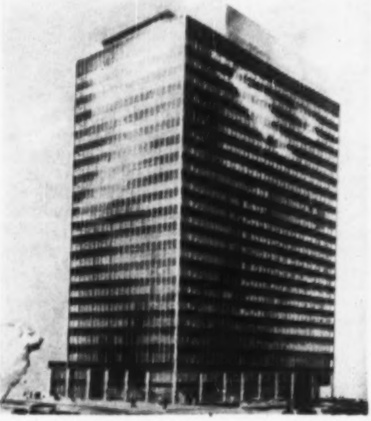
"In approaching the design of this 60x150 ft building, we were faced with many requirements," said Milton M. Schwartz, of Milton M. Schwartz and Associates. They included:

An exterior covering that would last from 50 to 90 years; weigh a maximum of 4 psf; have a thickness of 1 in. to allow for maximum space in the rooms; and have an insulation factor of 0.25, which is about equal to a 12 in. brick wall with plaster.

The curtain wall would also have to meet the Chicago building code requirements of 3 hr fire resistance and withstand a 120 mph wind velocity. It also had to be completely waterproof; flexible enough to take into account expansion and contraction; easily removable for repair or replacement; furnish a minimum of sound transmission; and inexpensive to maintain.

The result was a steel curtain wall consisting of three basic components: stainless steel panels, sub-steel supports and aluminum windows. The steel panels consist of a 26 ga stainless steel exterior face with 1 in. glass fiber insulation and 24 ga galvanized steel inside face.

The required 3 hr fire protection was secured through the integration of a 2 in. metal lath and vermiculite plaster backing on the stainless steel panels enclosing the living areas.



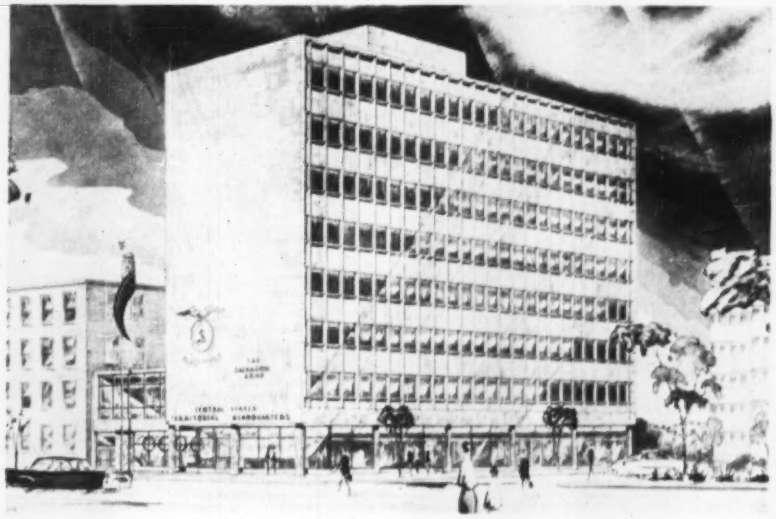
**• Borg-Warner Building**—Decision to enclose this 22 story building with a curtain wall of blue porcelain-enameled steel panels was in keeping with the American industrial scene, reflecting the technological advances of the corporations whose offices will be located in the building, said Lawrence Amstadter, of A. Epstein and Sons, Inc. It was also in keeping with such innovations as automatic elevators, translighted and acoustic ceilings, high-velocity induction heating and cooling, and electronic office machines.

A 4 ft 8 in. module was chosen for the vertical aluminum mullions that receive the perimeter partitions, to furnish maximum flexibility for the perimeter offices. Most of the private offices are of the 9 ft, two-window type. And a floor height of 11 ft was chosen to allow 2 ft for floor construction, duct work and recessed troffer lighting, and 9 ft clear ceiling height.

The blue-colored steel sandwich panels consist of a brake-molded porcelain-enameled face on 16 ga steel, and 16 ga galvanized steel back sheet with a 1 in. glass fiber insulation between the facings.

The concrete floor slabs of the reinforced concrete building are extended to receive the aluminum mullions by means of steel clips. The insulated panels are backed up with 3 in. gypsum block above the floor line and 2 in. lath and plaster in the ceiling space, to conform with the required 3 hr fire rating for exterior walls.

Vertically between the spandrels are the windows, every other one of which has an operating vent. This will permit ventilation in each perimeter office should there be a temporary mechanical failure, or a power shortage requiring the fans to be shut down, said Amstadter.



• **Salvation Army Building**—The curtain walls of this 8 story Territorial Headquarters building will be reddish brown porcelain-enameled steel, according to Leif Skadberg of the Skadberg-Olson Company. In the preliminary planning, comparative costs of a curtain wall system and masonry walls indicated that masonry wall construction would be about $15,000 less than the curtain wall. On the other hand, there would be a 1,200 sq ft gain in net floor space by the use of curtain walls.

A comparison of the heat transmission properties of the two types of construction indicated that the 2 in. insulated panel construction backed up with furring and plaster with a *U* factor of 0.15, would have a better resistance to heat transmission than a masonry wall, furred and plastered (*U* factor 0.25). Thus, the $15,000 savings on masonry construction could easily be eaten up by the cost of additional air conditioning and heating loads, Skadberg said.

The basic design contained an extruded aluminum grid system into which were set vertically pivoted windows and porcelain-enameled steel panels. The porcelain-enameled panels were chosen because of the economy factor and because of the range of colors available. Aluminum for the grid system was chosen because of light weight and overall economy, while the vertically pivoted windows were selected to facilitate window washing from the inside, with a resulting operational economy.

The curtain wall, as finally built, consists of 4 in. x 7 in. vertical aluminum mullions spaced 4 ft 9⅝ in. c-c. The mullions are split vertically to take care of horizontal expansion and contraction of the grid system, and are continuous for two stories in height.

The panels are 4 ft 5 in. by 5 ft. 6 in. They are 2 in. thick and contain a rigid cellular glass insulation. The exterior surface is porcelain-enameled steel, and the interior surface galvanized steel. Fireproofing requirements are satisfied by using a free interior wall of metal furring with metal lath and plaster, said Skadberg.

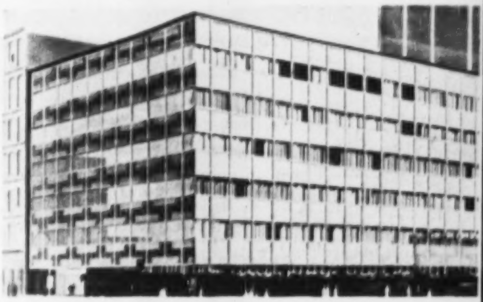
• **Morton Salt Co. Building**—In designing this 5 story building our designers gave serious consideration to many types of facing materials for the curtain-wall construction, said Victor L. Charn, executive vice president, Graham, Anderson, Probst & White, Inc.

The result was a curtain wall of stainless steel panels and windows. Stainless steel was chosen because it has a yield strength of 40,000 psi, and is durable as well as corrosion-resistant. Another factor in its favor was its availability.

The sandwich panels are 8 ft 6 in. by 5 ft 9 in. high and 2 in. thick. The exterior stainless steel was fabricated from 20 ga sheet, with vertical flutes about 16 c-c. Panel insulation consists of 2 in. of glass fiber.

Actual production of the spandrel sections of the 20 ga material proved that this gage if carefully fabricated and proper consideration given to shipping and installation, is most satisfactory and successful. Moreover, the sandwich panels permitted rapid erection and economical construction.

Other basic considerations that led to the choice of this type of curtain wall is that the stainless steel has enduring beauty; it is relatively maintenance free; and permits more space in the enclosure because of the thin exterior wall, declared Charn.



• **Mutual Trust Life Building**—This six-story building will have curtain walls of two-tone blue porcelain-enameled steel panels, and stainless steel mullions, according to John E. Starrett of Perkins & Will. This type of curtain wall was selected based on design considerations of scale and color combined with the durability of stainless steel and porcelain enamel in conjunction with interior glass.

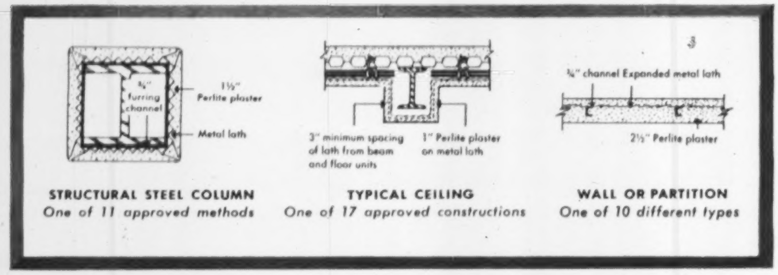
The reduced thickness of perimeter walls also was of considerable importance. The building is air conditioned

**38**

**There are 38 ways to cut dead load and get maximum fire protection with Permalite**

THE LARGEST-SELLING PERLITE AGGREGATE IN THE WORLD

Pound for pound, dollar for dollar, no other system of fireproofing surpasses the versatility of lightweight Permalite-aggregate plaster – a fact proved in many of the nationally known buildings erected during the past 10 years.


¾" furring channel
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*One of 11 approved methods*

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*One of 10 different types*

**WEIGHT** – In multi-story steel frame construction, with conventional fireproofing, more than 10% of the steel does nothing but hold up its own fireproofing! Permalite-aggregate plaster lets you cut this dead load. For example, the fireproofing weight on a typical column fire-protected with Permalite-aggregate plaster ranges from 38% to as little as 11% of the weight of conventional fire-proofing – and still gains a full 4-hour fire-rating.

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**BONUS FEATURES** – Since no expensive forms are required for fireproofing with Permalite-aggregate plaster, both days and dollars are saved. And finally, most important, the Permalite plaster fireproofing itself furnishes a perfect base for interior finishing and decorating.

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### . . . Building renaissance

and the dictates of topnotch air-conditioning equipment as presently available requires considerable perimeter space under the window stools, he said.

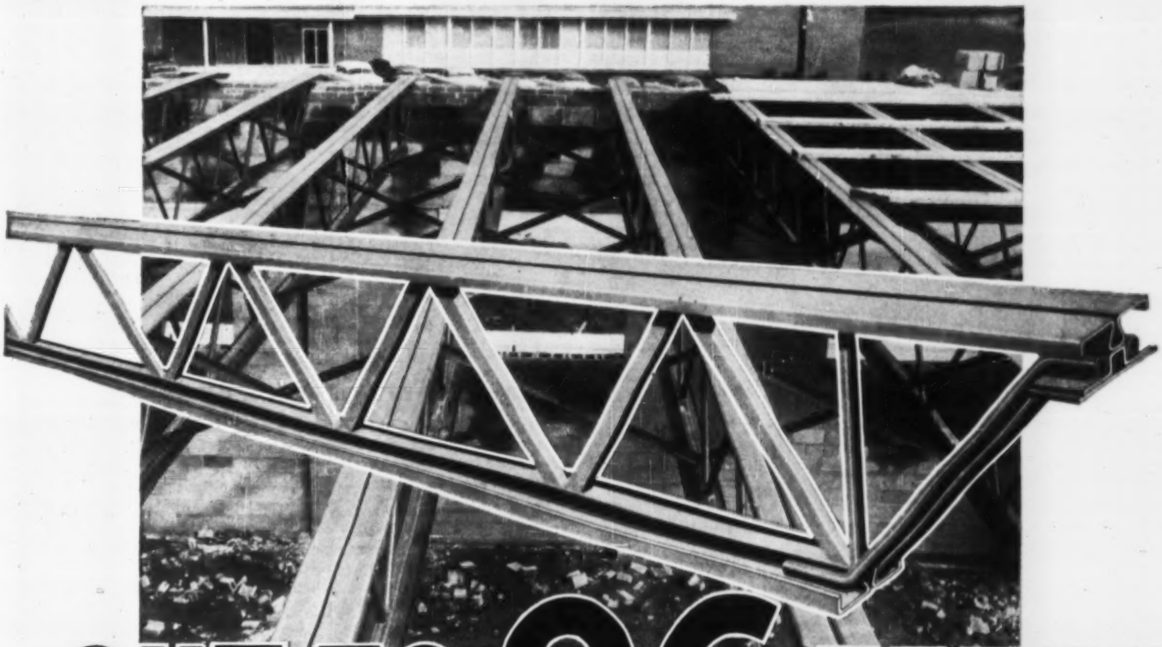
**• 4100 Marine Drive Apartment**–The curtain walls of this 19 story apartment building, on which construction will start soon, will be porcelain-enameled steel, with carbon steel mullions, according to L. R. Solomon of L. R. Solomon and Associates. Our cost analyses definitely indicate that conventional construction is less costly than metal curtain wall, he said. However, the gap between these costs has been partly bridged, to a point which permits the use of metal curtain-wall construction where it is desirable in the design.

It is no accident that metal curtain wall should emerge as a system of enclosing building structures such as this one. Its appearance and use in the field of architecture is timely and orderly and has come out of a need which now exists and could not have been satisfied before, he said.

Consensus of the panel is that there is a significant trend today to steel curtain walls in the construction of office and apartment buildings, schools, hotels and auditoriums. Such construction provides structural savings through reduction of load, permits earlier occupancy, reduces maintenance costs, and provides more square feet of usable floor space for a given lot area. As pointed out by one participant, a reduction of 6 in. in the wall thickness of a 100x200 ft building 20 stories high, renting at $6 per sq ft per year, creates an increase in rentable floor space representing an additional annual income of $36,000.

Chicago Dynamic Week was sponsored by U. S. Steel Corp. to promote an awareness of architecture on the part of Chicago citizens and to improve the relationship between businessmen and architects.

# Now V-GIRDERS



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To aid in the handling and transportation of the longer lengths, shipment is made in two segments with the same type of strong, simple field splice used in Macomber Bowstring Trusses over the past 35 years.

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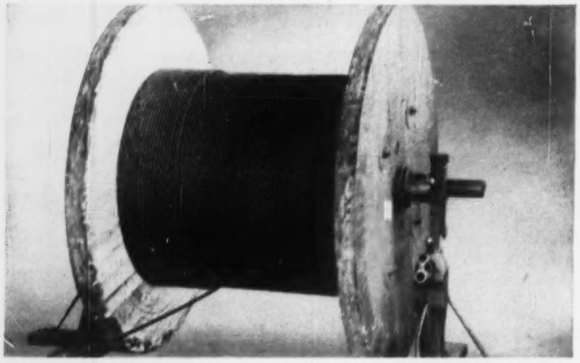
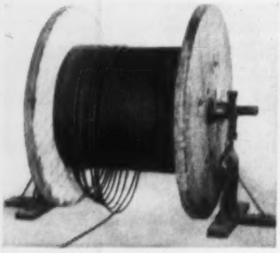
# Tuffy® Wire Rope Tips



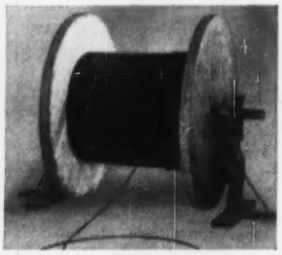
### Here's the way to set up reel for unwinding

The stock reel should be set up on jacks, so the rope will come from the under side of the reel as shown in this picture.



### This reel is set up right

Unwinding has started, and the reel is spinning faster than the rope is being pulled off. But because it's coming from the under side of the reel, the rope is simply loosening on the reel, with no damage.



### This reel is set up wrong

The rope is coming from the top of the reel and forming loops as the reel over-runs. These loops are likely to form kinks and dog-legs, which can be ruinous to rope life.

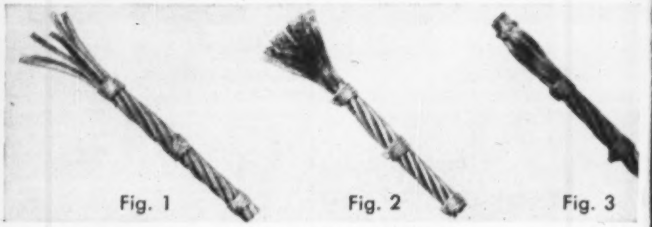
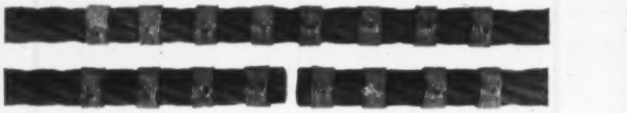


Fig. 1 Fig. 2 Fig. 3

### Eight steps of correct SOCKETING

1. Securely seize and serve with soft wire ties before cutting, and have at least two additional seizings placed at a distance from the end equal to the length of the basket of the socket.
2. When the rope is properly seized, take off the end seizing. Cut the fiber center back to the seizing, as shown in Fig. 1 above. Untwist and broom out the wires. See Fig. 2.
3. Clean the wires for the distance they are to be inserted in the socket. Use benzine, naphtha or gasoline. Then dip the wires in commercial muriatic acid, to a depth not greater than ¾ of the cleaned length of wire. Keep them immersed for 30 seconds to 1 minute, or until the acid has thoroughly cleaned each wire. Be sure acid does not contact any other portion of the rope.



### Follow these steps for PROPER SEIZING

Since practically all wire ropes today are preformed, we suggest that when cutting you put only one seizing on each side of the cut.

When cutting ordinary ropes, thoroughly seize (bind, serve or tie) so there will be no misplacement or relative movement of strands. For most ropes, other than preformed, *three* seizings should be used on each side of the cut. *Four* seizings on each side are required for a lang lay rope, or any rope having an independent wire rope core or a wire strand core. *Four* seizings are also needed for all 18x7 ropes, and all ropes larger than 1" diameter.

## **Tuffy** Special Wire Ropes are tailored to special use. Ordering is easy:

### **Tuffy** Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.

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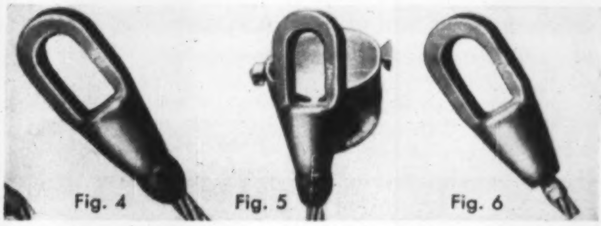
Constructed to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves, hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

# Watch your steps

## when you unwind, seize, clip, socket and reeve wire rope



**4.** Dip the wires in boiling water containing a small amount of soda, to neutralize the acid.

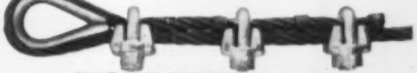
**5.** Place a temporary tie wire over the ends of the cleaned wire (see Fig. 3). Be careful not to get the cleaned wires greasy or oily.

**6.** Insert the rope end into bottom of socket. Remove temporary tie wire.

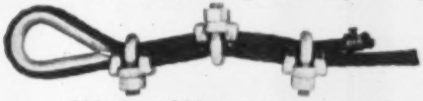
**7.** Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (Fig. 4). Pour in among the wires about ½ teaspoon of sal ammoniac crystals.

**8.** Pour molten zinc into the basket to fill (Fig. 5). When zinc is solidified, remove seal. Socketing is complete as shown in Fig. 6.

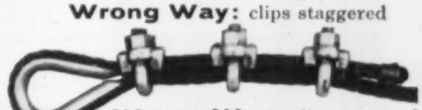
### Attaching by CLIPPING



**RIGHT WAY** for greatest rope strength

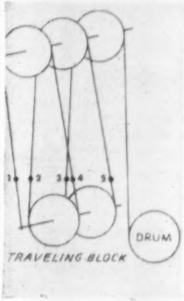


**Wrong Way:** clips staggered



**Wrong Way:** clips reversed

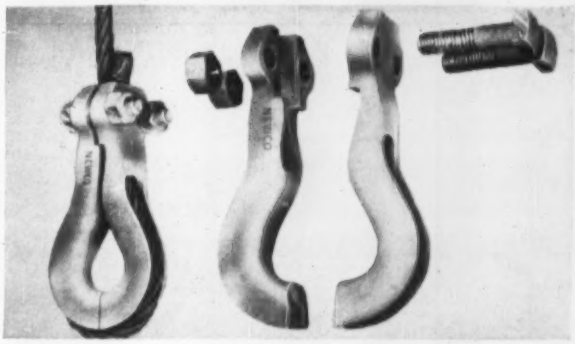
### REEVING



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves.

Here's how to count the number of parts supporting the load. Draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.



The fitting you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power from crimping action are harmful to the rope.

Shown here is a clamp that has no wrong side—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost solely by friction rather than by crimping action. Combined in its two parts is a thimble and the parts are interlocking to prevent collapse of the thimble and to eliminate all shear on the bolts.

## Just say **Tuffy** give length and size, and forget complicated specifications.

### **Tuffy** Slings and Hoist Lines

Here's the team that does a topflight job with every type of materials handling. **Tuffy Slings** are made of a patented, machine-braided fabric; stays extra flexible; can't be hurt seriously by knotting or kinking. **Tuffy Hoist Line** is a special construction of super flexibility and toughness.

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If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. Just say the word!

If you don't know him already, see your classified telephone directory, under Wire Ropes or Slings.

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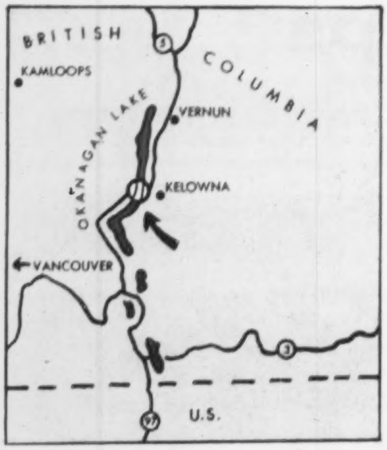
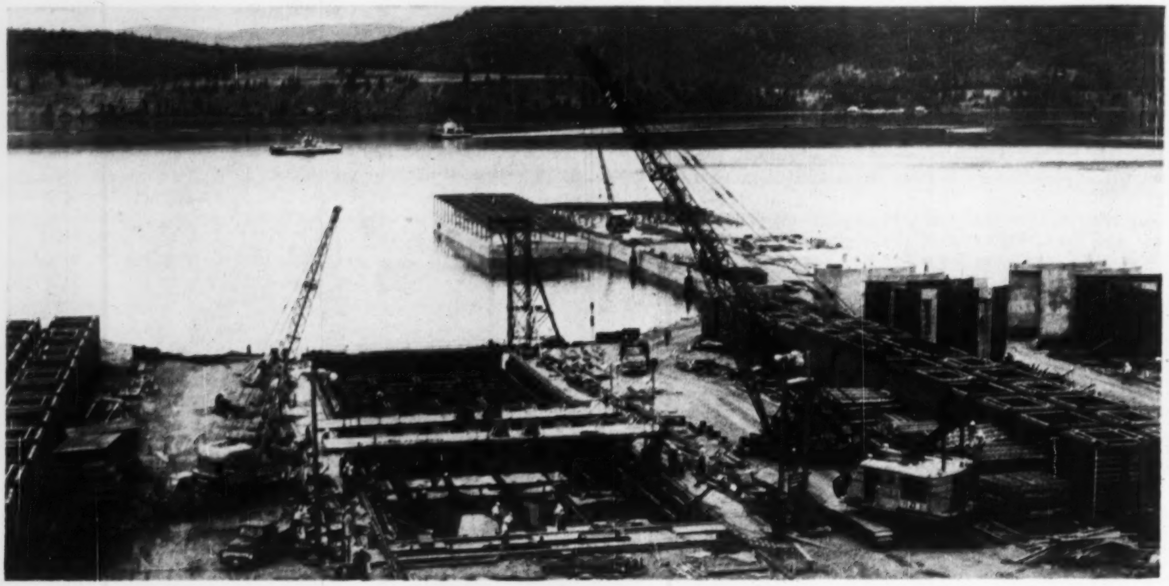
2228 Manchester Avenue, Kansas City 26, Mo.

*Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand*

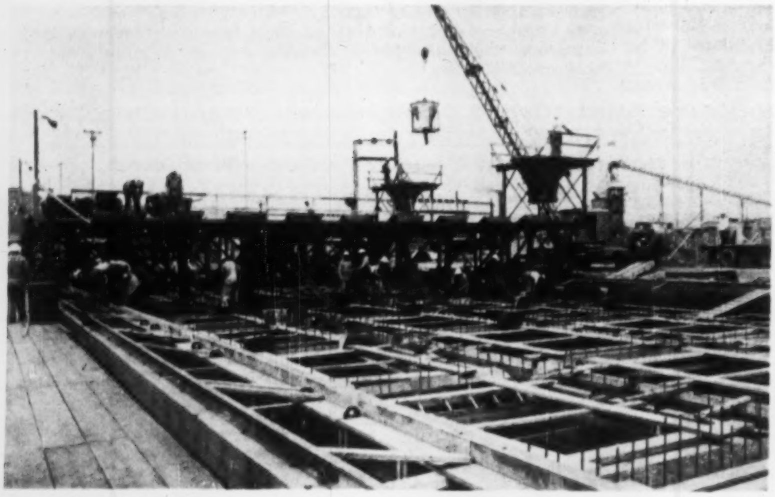


# Floating Concrete Breaks a

Across Lake Okanagan, in the center of a resort and agricultural area in the interior of British Columbia, Canadian engineers and contractors are using a type of bridge that hasn't been built in North America in the last two decades. It's part of a move to speed traffic along an important link in the Trans-Canada Highway system.



**GRAVING DOCK** is one of two built on the shore of Lake Okanagan at Kelowna, B. C., for casting elements of a floating bridge. Pontoons already cast are tied up just off shore; when positioned, they will be held by 70 ton concrete anchors.



**CONCRETE IS DISTRIBUTED** to 50 ft wide pontoons from rail-mounted gantries. Two such bridges were used, one for the bottom slab, the other for the walls.

**CONCRETE-POURING BRIDGE** is from one graving dock to the other.

# Bottleneck

The first reinforced-concrete-pontoon, floating bridge to be built in North America in almost 20 years is well under way in British Columbia. It will provide a vehicular crossing of Lake Okanagan at Kelowna some 300 miles by highway east of Vancouver.

Both a suspension bridge crossing and a rockfill mole-type crossing had been considered, but poor lake-bottom foundation conditions led to the adoption of the floating design. Then too, the feasibility of the floating bridge crossing was enhanced by the fact that the lake level is controlled to a maximum variation of 4 ft by a weir at its southern end.

The bridge is 2,885½-ft-long between approach rockfills which are 1,400 ft long on the west bank and 300 ft long at the Kelowna end. The length includes a 175-ft-long steel approach span at the west end. At the east end is a 660½-ft-long three-span steel bridge that includes a 284½ ft lift span.

The floating section includes two 50 x 50 ft transition pontoons which support at mid-point steel approach trusses. The rest of the floating structure is composed of ten, 200 x 50 ft concrete pontoons.

The larger pontoons have 56 cells and are 15 ft deep. The smaller transition pontoons are somewhat deeper.

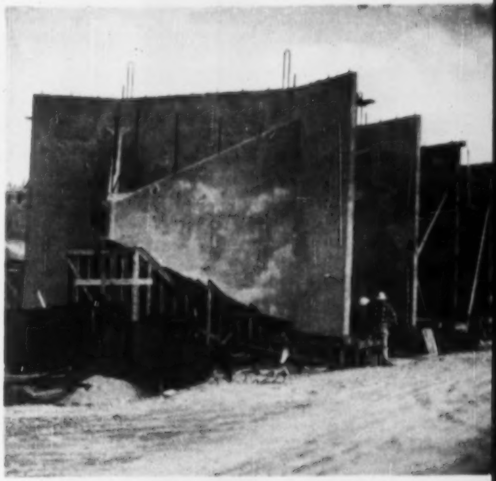
Four of the 200 ft pontoons—two at each end—mount steel superstructures to raise the roadway grade to meet approach span level. On the remaining six units, the roadway is on the concrete deck.

Although patterned after Seattle's highly successful Lake Washington Bridge, there are marked differences between the structures:

- The Kelowna pontoons are shorter and sturdier.
- Pontoons are cast in graving docks as at Seattle, but two (instead of one) concrete pouring gantries are used;
- The Kelowna Bridge has a steel lift span at one end to pass large lake vessels; the Seattle bridge has a sliding pontoon section at midlake;
- And the Kelowna anchorage system accommodates changes in the lake level without jacking the cables.

**• The pontoons**—The Lake Washington Bridge includes 25 pontoons each 350 ft long by 59 ft wide and 14½ ft deep. The Kelowna pontoons are smaller largely because of the narrower roadway, and since Lake Okanagan is subject to occasional winter icing, the Kelowna pontoons are designed to resist ice pressure. They are about twice as strong as those of the Lake Washington crossing.

**HORIZONTAL BEAM** pointed out will give pontoon resistance to ice thrust.



**CONCRETE ANCHORS** 32 ft wide by 20 ft high, will be jetted into soft lake bottom.

Major resistance to ice pressure is provided by a horizontal beam at water level. However, all walls and slabs include heavy reinforcing with steel totaling about 450 lb per cu yd of concrete.

Adjacent pontoons are rigidly connected by 1¼ in. dia high strength bolts with 146 bolts for each connection. A rubber seal along the bottom and sides makes the space between the pontoons watertight. The connection is filled with pressure grout.

**• Anchors**—Each pontoon is to be secured by a pair of 70 ton concrete anchors—one on each side.

These anchors are to be jetted at least 20 ft into the soft lake bottom with jet pipes built into the anchor walls. Pumps capable of delivering 2,000 gpm at 200 psi will serve the jetting operation.

Connecting the pontoons and the anchors are high-strength, 91 wire steel cables having a net area of 3.2 sq in. The cables are prestressed at the plant after manufacture by British Ropes Canadian Factory, Ltd.

The connection to the pontoon is arranged to permit jacking of the cables to a tension of up to 100 tons depending on the lake level at the time of installation.

The location of the anchors was set so that the cables would have a predetermined angle depending on the depth of water. The selected angles are such that a change of 1 ft in the level of the lake will change the cable stress 9,000 psi for all lengths of cable. On the Lake Washington Bridge it is necessary to jack the cables to keep the stresses within prescribed limits.

**• Graving dock construction**—Two graving docks were constructed at Kelowna for the job. And at the same time a large work area was provided. An offshore shoal of sand was excavated by dragline cranes from fingers extending into the lake. This provided depth for the huge concrete floating masses and sand fill for the work area.

The graving docks were outlined by double rows of heavily-braced timber piles on about 10 ft centers in both directions. The piles are capped and decked to provide a service platform for the drydocks.

Wellpoints and headers were installed between the double row of piles to dewater the area. Each basin requires about 250 wellpoints on 18 ft risers. Wellpoint pumps are housed in underground precast concrete watertight basins.

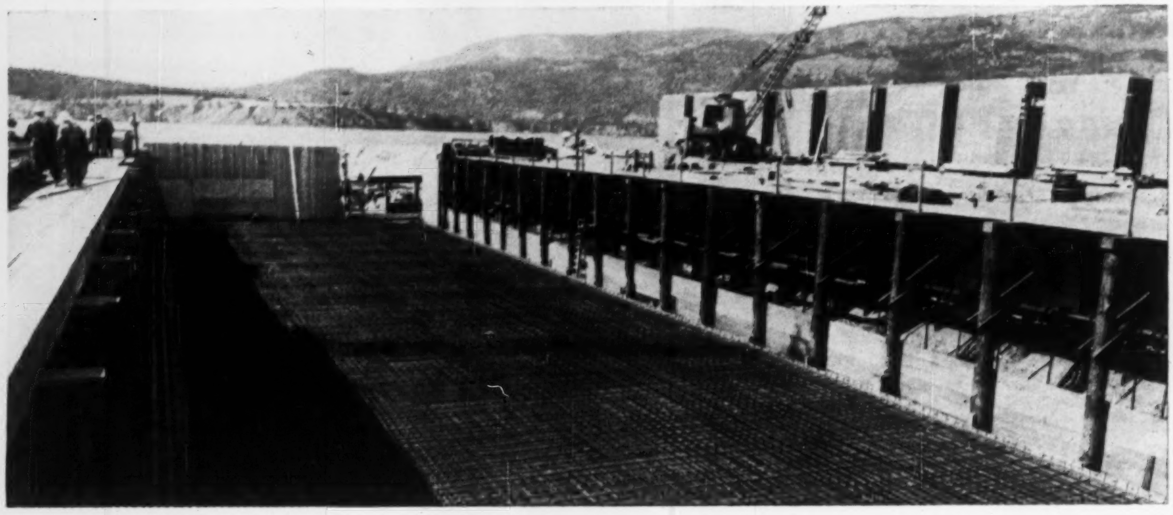
By keeping elevation of the wellpoint pumps low, double-stage pumping is eliminated, and the pumps do not have to be moved when the drydocks are flooded because they are protected by the watertight housing. Actually the wellpoint pumps are kept in operation when the basin is flooded to keep water level low in the perimeter sands. Flooding and dewatering is accomplished by larger sump pumps.

The north basin has two 10 in. wellpoint pumps, and the south basin, located in coarser sand, has four 8 and 10 in. wellpoint pumps. All pumps are powered by electric motors. The job has a stand-by diesel-electric generator for use in the event of a stoppage in the municipal power supply.

The graving docks are 58 ft wide by 220 ft long. The north dock is 15 ft deep and the south dock is 4 ft deeper to accommodate casting of the deeper transition pontoons and the precast floating caissons for approach span pier foundations.

**• Concreting cells**—Sheetpile cutoff

## . . . Heavy reinforcing is big problem in thin walled pontoons



walls were constructed at the lake end of each dock to help keep the lake water out. Concrete gate sills supported on wood piles then were cast above them. Each gate consists of a steel truss and laminated timber assembly covered with plywood. Gates are hoisted by use of a combination of a stationary steel tower on one side and a crane on the other.

The drydocks were constructed during the winter with first concrete pour made on the pontoons in the spring of 1957. While the outside work area was being prepared, carpenters were fabricating the inside forms working in a rented warehouse at a nearby lumberyard. This meant that the forms were ready when the drydocks were ready. And it put to use a supply of carpenters that might otherwise have been unemployed in the winter months. The carpenters were transferred to forming operations when concrete pouring began.

The pontoon cell forms are supported by horizontal studs and vertical walers. They break out in four panels except for the exterior cell forms where the ice beam is located. These forms come apart in smaller sections. The top of the ice beam form is left open.

A complete set of 56 cell forms is provided for each dock with each set of forms having five re-uses. Cells for the smaller transition pontoons are smaller and those forms were not re-usable.

Three to four weeks of graving dock time is needed to cast each pontoon. About ten working days are required to form the bottom slab and the walls. Then, after placing concrete up to the top deck soffit, another four working days is needed to strip the cell forms and form the deck. Pontoons are launched two days after the deck is cast.

• **Reinforcing is a problem**—The most critical graving dock operation from a time standpoint is placing the heavy reinforcing in the thin walls. And placing steel for the anchor cable connections is the most time-consuming phase of the reinforcing work. (Reinforcing is placed by Concrete Reinforcing Engineering Co., Ltd., of Vancouver which is the only major subcontractor on the work.)

The bottom plywood form for the pontoon floor slab is supported on piles with a cap system of 12 x 12 timbers and 2 x 10 joists. After the base slab reinforcing is placed, the pontoon cells are positioned using nails in the dock bottom to show location. The cells are placed on male-female positioner assemblies on two opposite corners. Screw jacks put the cells at exact elevation.

Concrete is provided by an 80-cu-yd-per-hr fully-automatic batch plant equipped with two 2 cu yd mixers. Casting the bottom slab and walls requires some 800 cu yd and takes about 30 hours.

Concrete is transported from the mixing plant to the drydocks in 1 cu yd buckets on flat-bed trucks. Truck-cranes lift the buckets to 6 cu yd hoppers mounted on the concrete pouring bridges. The concrete is moved from the hoppers to elephant trunk hoppers by hand buggies.

A major difference between the Kelowna Bridge pontoon construction and the Lake Washington work is that two concreting gantries are used at Kelowna.

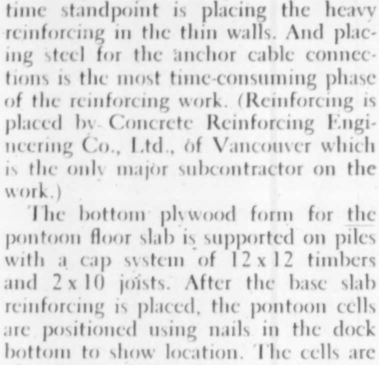
The front bridge delivers concrete for the bottom slab and the back bridge following fairly closely handles the wall concreting. At Lake Washington floor slab concrete was cast off the front end of the bridge and wall concrete off the back end.

Each bridge is equipped with nine electric vibrators having 1⅜ in. dia heads. The small size head is necessary because of the thin walls (6 in.) and the heavy reinforcing. In addition, the forms are vibrated from the outside with chipping guns equipped with bucking heads.

• **Natural gravel aggregate**—Aggregate is developed in a mountainside pit near Kelowna. Only natural gravels are used; no crushed material is permitted due to concrete placing requirements.

Rock is brought to the job rough-screened in three sizes plus sand. Since no water is available at the pit, the aggregate is washed and rescreened at the job. Rock is stockpiled in three sizes —No. 4 to ⅜; ⅜ to ¾ and ¾ to 1½ in.— with the large size used for piers and heavy work but not in the pontoons. Sand is stockpiled in two sizes. The aggregate source is deficient in fines and sand from the lake makes up the deficiency.

After the floor slab and walls are placed and the cells stripped, the deck



**TOP SLAB FORMS** are kept in place by collapsible wooden grids.

Aerial views of Houston freeway

# FOR FREEWAYS

## Concrete Gives

## Lower Annual Cost and Longer Life

Enormous increases in highway traffic by passenger cars and heavily loaded trucks have made the patterned mazes of today's freeways a transportation necessity.

America's most modern freeways use concrete—the road material which provides smooth uninterrupted travel regardless of the loads to be carried or the weather, at a lower annual cost. Here again, concrete serves the rapidly expanding needs of the nation with a construction material whose flexibility of use and durability have made it a "must" for good freeway construction.

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PORTLAND IDEAL CEMENT

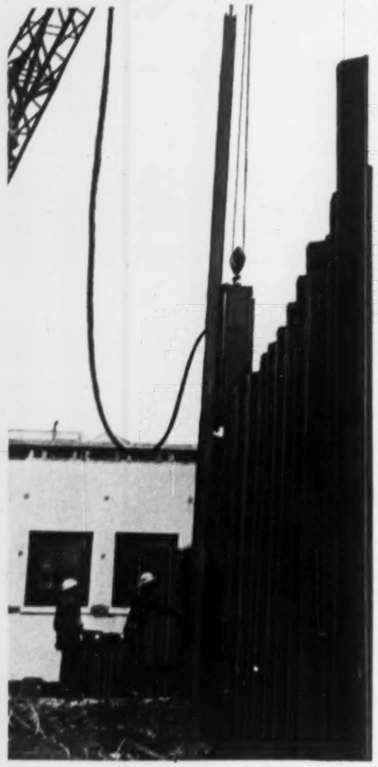
**IDEAL CEMENT COMPANY**

DENVER, COLORADO

*14 Plants and 3 Terminals Serving*
*Some of the Most Rapidly Growing Areas of the Nation*

**At 3 P.M....**

**CAVE-IN!**



Cave-ins will happen, through no fault of the contractor. On this excavation job, there was erratic soil behavior, shifting loads, saturating rain . . . everything unpredictable.

When it happened, L. B. Foster Co. was called at 3 P.M. for rental steel-sheet piling *in a rush*. We cut MP-116 piling in our yard, and delivered it in Foster trucks to the job site 400 miles away before the crews started work next morning.

This is typical of the dependable help contractors can expect . . . and get . . . with Foster's Piling Rental Plan. Always the exact length and exact section . . . when you need it . . . on low fixed cost. Call your nearest Foster office for quotations—find out for yourself the real savings in Renting Piling from Foster.

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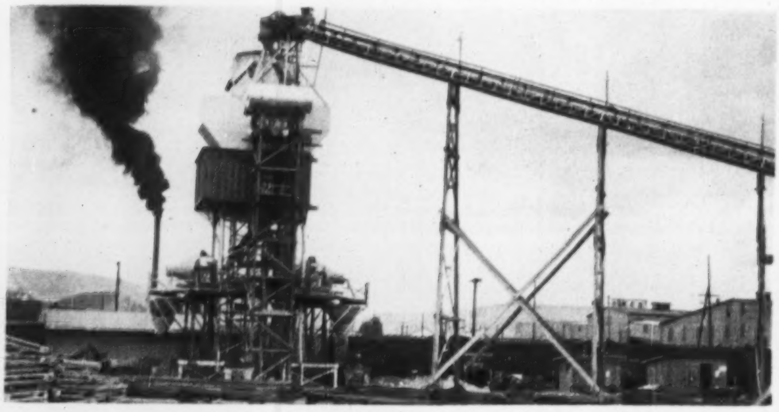
RAILS • TRACK EQUIPMENT
PIPE • PIPE FABRICATION

L.B. FOSTER co.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

## . . . Pontoon form supports are expanding grids



**BATCH PLANT** serving the job is the only automatic unit in the British Columbia interior. Plant capacity of 80 cu yd per hour easily handles the 800 cu yd, 30 hour pours.

slab is formed. This presents peculiar problems in that the deck from work must be stripped and removed through 2 x 4 ft manholes. Each group of four cells is a single watertight compartment provided with a manhole. Thus, in addition to passing through the manhole, most of the forming material must pass through one opening between cells—some through two cell wall openings.

**• Expanding form supports**—The key to working in the tight space is the use of expanding form supports that can be handled by hand. These span 38 in. and compress to 22% of the expanded area. They eliminate about 50% of the forming pieces.

The expanding form supports are made of 1⅛ x 1⅛ in. strips of Sitka spruce. The wooden strips are joined on about 3 in. centers by cadmium-plated drive rivets that permit the rotation of the pieces.

**• Lift span piers**—Work of the general contractor also includes floating caisson piers to support the steel lift span. The biggest unit—the west main pier—is 85½ ft deep. But height of concrete at launching was about 20½ ft with timber caisson walls extending it to 41 ft. After casting both piers in one of the graving docks, the caissons were towed out into the lake where additional lifts were placed. Then they were towed to the bridge pier site where still more lifts sunk them into position.

The piers are supported on timber piles driven into the lake bottom by an underwater piledriver. Water is admitted into the cellular interior of the piers to preload the piles.

The lift-span bridge is of routine design with all operating machinery in the towers. However, the transition spans at each end between the floating bridge section and the fixed section are unusual. These through truss spans must accommodate four types of motion:

Longitudinal motion due to temperature, live loads, currents and wind;

Lateral motion due to currents, wind and ice;

Vertical motion due to live load and water level change;

And a torsional motion due to lateral wind and unbalanced lane loading.

Thus, all floor beams are hinged and wind bracing has slotted connections. And the spans are mounted on flexible supports on the end pontoons.

**• Owner Engineers**—The Kelowna floating bridge is a project of the British Columbia Toll Highways & Bridges Authority. Design was prepared by Swan, Wooster & Partners, consulting engineers of Vancouver under the direction of H. F. Wooster with W. Pegusch and W. V. Coventry designing engineers for the floating structure and the steel superstructure respectively. C. E. Andrew served as consulting engineer to the designers. D. C. Gough is resident engineer for the consultants.

**• Joint venture**—Contractor for the concrete pontoons and the approach span bridge piers with a $4,743,885 low bid is Kelowna Bridge Contractors, a joint venture of General Constuction Co., Ltd., of Vancouver, B. C., and Pacific Bridge Co. of San Francisco, Calif., with the latter as project sponsor. Approach fills were constructed in the summer of 1956 by General Construction Co., Ltd. Steel spans will be built by Dominion Bridge Co., Ltd.

For Kelowna Bridge Contractors, Emerson Hail is project manager, Chris Anderson is general superintendent and T. B. Coull, Jr., is project engineer.

The floating portion of the bridge will be completed this year. Steel approach spans will be erected in 1958. Cost of the project is $8 million.

*Kenneth Erickson, Transportation Foreman, Vanadium Corp. of America, Durango, Colorado, reports:*

# "We get up to 225,000 miles' service on torture roads like this...with nylon cord tires"

**300 MILES A DAY.** Sharp rock, sand, water holes and chuck holes give tires a rough time on this haul from Monument Valley, Arizona, to Durango, Colorado. They've got to carry the weight of 12- to 22-ton loads of uranium ore 300 miles a day in temperatures that range from 0° in winter to a blistering 110° in summer.

**RESULTS WITH NYLON.** "In spite of extreme weather and road conditions, these tough nylon cord tires give us as many as seven retreads. That's about seven times as many as we used to get. Mileage? We get 45-50,000 miles on original treads and an average of 25,000 miles on each recap. Our company uses from 35 to 40 vehicles on hauls like the one shown above, and we used to take heavy losses in maintenance and downtime. That was before we changed over to nylons 4½ years ago. Now we've cut down on tire costs . . . wouldn't think of buying tires without nylon cord."

**PROVE TO YOURSELF** that nylon cord truck tires, through retreading, give more mileage . . . the lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarn, does not produce tires.)

**Du Pont nylon for tire cord**

DU PONT

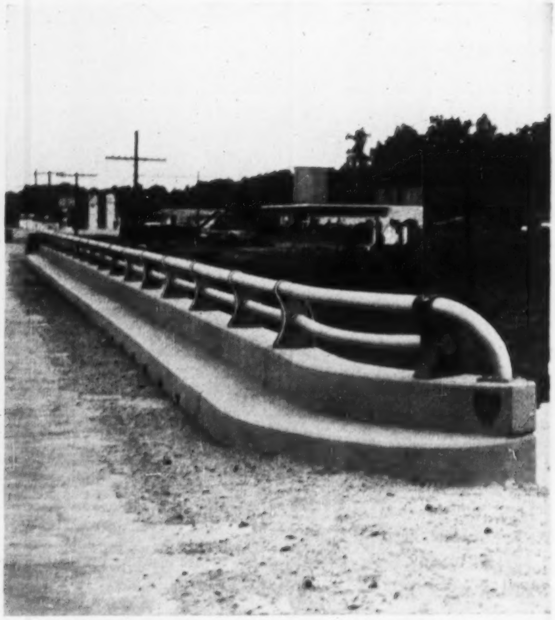
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

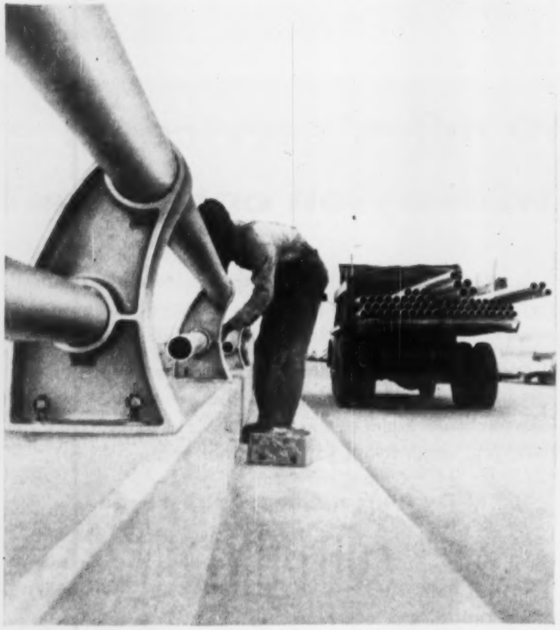
**For trucks and passenger cars, too . . . the strongest, safest tires are made with nylon cord**

# SEVEN THAT SAVED...through

**PA.-N.J. TURNPIKE.** Big job, big responsibility. Flynn railing components throughout this huge Delaware River Bridge and its approaches (7½ miles in all) were delivered as promised, installed quickly.



**STONY CREEK, VA.** Small job, small budget. But the railing had to be attractive, easy to install, and permanent. Flynn aluminum railing and posts filled the bill perfectly, even to special railing-end design.



**HAMPTON ROADS, VA.** Flynn railing and posts arrive at the site on schedule to keep pace with other construction operations. No elaborate unloading or storage setup needed—weather can't hurt these parts.

CIR 33⅛-1 128

**PHILADELPHIA-GLOUCESTER.** New Walt Whitman Bridge between Philadelphia and South New Jersey uses Flynn aluminum railing sections of the baluster type. Only two men are needed to install them.

# Flynn aluminum bridge railing

These seven recent installations of Flynn bridge railing help prove the versatility and economy of lightweight Flynn aluminum components. From the largest to the smallest job, Flynn railing, rail seats, castings, anchor bolts—all made from aluminum alloys of the highest quality—are delivered as specified and when needed. When it comes to railing on your next bridge or highway job—*ask Flynn first.*

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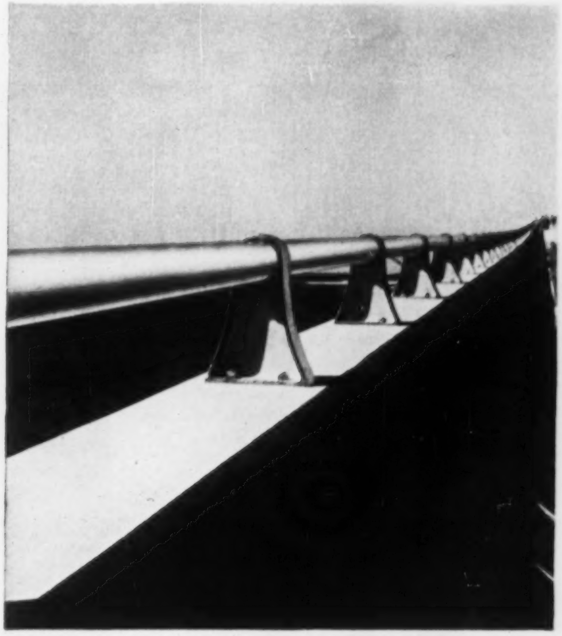
THOMAS BLDG., 1314 WOOD ST., DALLAS 2, TEXAS. . . . . . Tel.: RIverside 8-5935

**FLYNN**
EXTRUSIONS

**WILMINGTON, DEL.** This new Walnut Street drawbridge in Wilmington has a combination of round and rectangular Flynn railings. Installation is made easier by precise fitting of bolt holes between parts.

**McARTHUR CAUSEWAY, FLA.** Attractive Flynn railing and posts can be obtained in a wide variety of styles to fit any landscape, save design time and money, enhance the beauty of the surroundings.



**GARDEN STATE PARKWAY.** Beesley's Point bridge on the new north-south New Jersey artery, another large project where a few men, without cranes or lift trucks, did the whole Flynn installation job swiftly, economically.

FOR MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

# "Not one dime's worth of maintenance"

*Mr. Joe Cloghessy, Pres.*
*T. F. Cloghessy, Inc.*
*Hammond, Ind.*

That's this contractor's cost record with a Homelite Diaphragm Pump. Zero for maintenance . . . and he used the pump every day for three months on all types of tough, dewatering jobs. Was convinced last winter . . . when other pumps clogged with hardened sand and clay. The Homelite Diaphragm Pump worked when others wouldn't. Handles water thick with mud, sand, clay, gravel freely. Pumps 5,000 gals. per hour. Handles seepage easily. Starts instantly. Primes fast. Easy on fuel. And lightweight . . . weighs only 120 lbs. Prompt service available from your local Homelite Factory Branch. Write or call for demonstration.

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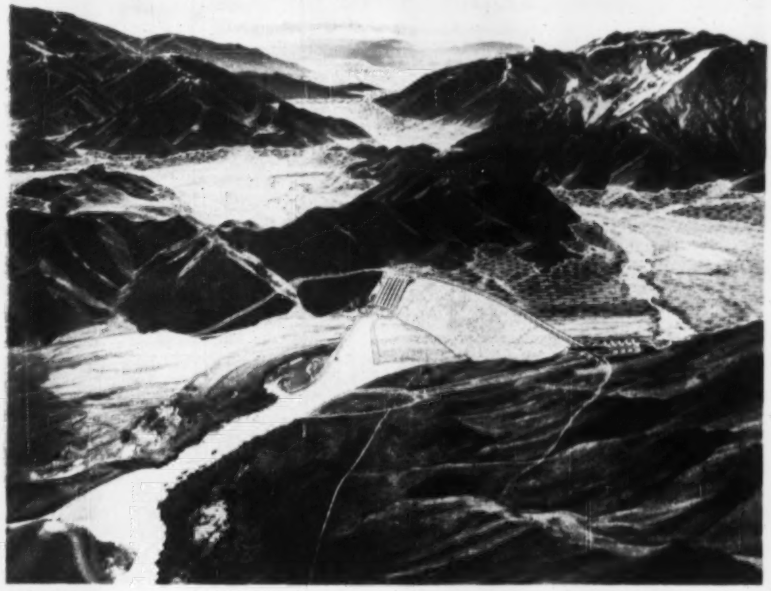
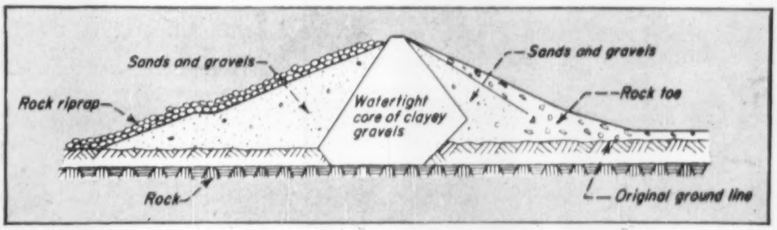


**BENMORE HYDROELECTRIC** project will have earth dam with intake, penstocks and powerhouse at right end (looking downstream), and channel type spillway at opposite end.



**EARTH DAM** will be 2,000 ft long, have a maximum height from foundation of 360 ft and a downstream face slope at 2½:1.

# Biggest Hydro for New Zealand

New Zealand's Benmore Project, a $100 million hydroelectric scheme on the Waitaki River, is to be the biggest of a chain of stations, probably 11, that will fully exploit the power resources of the Waitaki Basin. It is also the biggest single project yet undertaken in New Zealand.

Benmore—located just below the confluence of the Ahuriri and Waitaki Rivers, at about the center of South Island—will have an installed capacity of 480,000 kw. Further, it will be one of the first major parts in a program that calls for the eventual integration of the power systems of the country's two main islands by means of a submarine cable across 16 to 40 mile wide Cook Strait.

Mean natural flow of the Waitaki River at the damsite is 12,300 cfs, coming from three large lakes, Tekapo, Pukaki and Ohau and one major tributary, the Ahuriri. The 1,000 year flood has been estimated at 120,000 cfs and construction or 20 year flood at 70,000 cfs. Mean controlled flow will be 11,000 cfs.

Design calls for an earth dam requiring some 17 million cu yd of material and rising to a maximum height of 360 ft. Crest will be 2,000 ft from abutment to abutment; foundation width will be 1,800 ft and the top will be from 30 to 40 ft wide. Including concrete spillway and intake structures, total crest length will be 3,000 ft.

Materials for the earthworks and concrete aggregates exist in ample quantities within a radius of 2½ miles. There are well-graded tertiary deposits of clayey gravels and unlimited deposits of strong, well-graded and free-draining river gravels.

The site is free of major faulting, and basement rock consists largely of a series

Complete Line of Homelite Carryable Construction Equipment Now Available

**Self-Priming Centrifugal Pumps** . . . Carry these lightweight, dependable pumps anywhere. Non-clogging design . . . 28 foot suction lift . . . capacities up to 15,000 g.p.h. . . . sizes from 1½" to 3". Diaphragm pump also available.

**Chain Saws For Every Job** . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.

**Carryable Gasoline Engine-Driven Generators** . . . Lightweight Homelite generators can be carried and used anywhere to provide high-cycle and 115 volt power for your electric vibrators, tools, and floodlights. Complete range of sizes up to 5,000 watts . . . all standard voltages.

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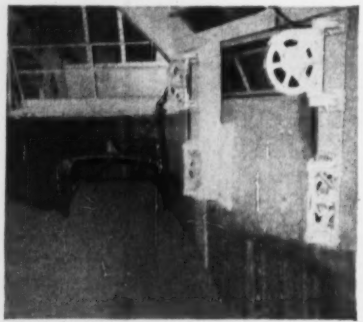
PORT CHESTER, NEW YORK

**these jobs were done at a lower cost with the**

**SAUERMAN METHOD**

**Silt Removal** by Slackline Cableway keeps channel clear for irrigation project. Bucket digs, then conveys spoil to downstream side of dam. (*Sauerman News 146*).

**Digging Gravel** for a plant supplying aggregate for 82 miles of turnpike, this 5-yd. DragScraper often operates around the clock. It has excavated over a million tons. (*Sauerman News 145*).



**Reclaiming Material** to hopper from all sections of a 500-ft. warehouse, the estimated operating cost of this DragScraper Machine is 2.1 cents per ton. (*Sauerman News 145*).

•

***You'll find a complete description of the Sauerman Method in Catalog A, DragScrapers; Catalog C, Slackline Cableways; and Catalog E, Bulk Storage by Scraper.***

**SAUERMAN BROS., Inc.**
632 S. 28th STREET
BELLWOOD, ILLINOIS

of steeply dipping beds of greywacke and argillites. Water-worn greywacke gravels to a depth of 60 ft overlie the basement rock where the valley widens.

Core of the earth dam will be founded on the basement rock for its full length. Shoulders will rest on the gravels of the valley floor. And on the valley sides, the shoulders will lie against the natural rock of the hillsides. Field tests have shown that the gravel beds are compacted to a high degree of density and settlement under the shoulders of the dam is considered unlikely to be a significant factor.

The impervious core of the dam will contain 5 million cu yd of clayey gravel; this will be covered by 10 million cu yd of sandy gravel and finally 2 million cu yd of riprap. The riprap will come from excavation, and in addition there will be some 1.6 million cu yd of common excavation. Average slope of downstream face will be 2½:1.

On the right bank, facing downstream, will be the power intake block, penstocks and powerhouse. Spillway structure will be on the left bank.

The spillway is to be a side channel type, with sluices incorporated at head of channel. There will be four crest radial spillway gates each 40x40 ft. The spillway block is to be entrenched in rock, and is expected to provide for the 1,000 year flood with no rise in lake level. Two bypass sluices controlled by radial gates some 110 ft below dam crest will ensure substantial safety margin and also make it possible to dewater sufficiently to expose intake and spillway structures.

In major flow, disposal of the surplus water should be quite a sight. A deflector at the bottom of the spillway will throw a jet of water into the air and spread it over a wide arc before it falls into a broad rock channel leading back to the river. The reservoir will have storage capacity of 1.6 million acre-ft.

The intake structure will be of reinforced concrete and will embody a short wing dam of mass gravity section. Water will be fed into penstocks set on trimmed rock face at a 30 deg slope, with an overall length of 600 ft. They will be of reinforced concrete lined with steel and about 17 ft in diameter.

The powerhouse will be 500 ft long and of steel frame and precast concrete panel construction.

Target date for first power is 1965. All work will be the responsibility of the Ministry of Works, for the State Hydro-Electric Department.

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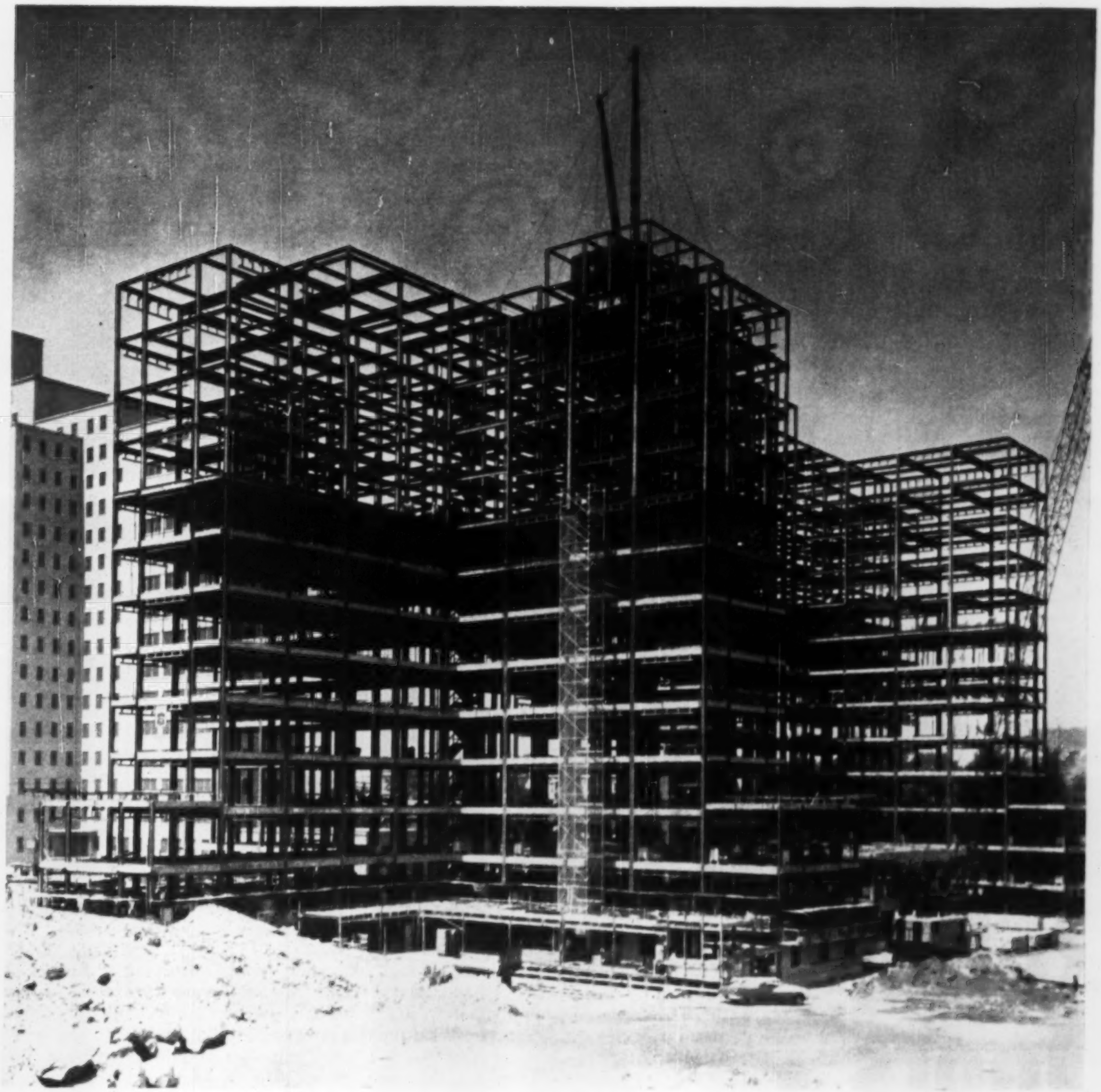
## Mobile Testing Lab En Route to Baghdad

Iraqi diplomats in New York City inspect a mobile testing laboratory that is en route to Baghdad. Consul Usamah Kadi examines equipment while the New York Consul General of Iraq, Hashim Hilli, looks on.

This laboratory, the third purchased by the Iraq Development Board in the last 18 months, is to be used for testing soils, concrete, asphalt and construction materials in that country's rural road and highway program.

The lab is air conditioned, has running water, compressor, and its own generating system.

(*International continued on page 58*)



# BUILDING 103

The scene is Ward's Island, in New York's East River, the site of Manhattan State Hospital.

Here we recently completed erection of the steel framework for Building 103, a 17-story structure which will greatly increase the hospital's facilities.

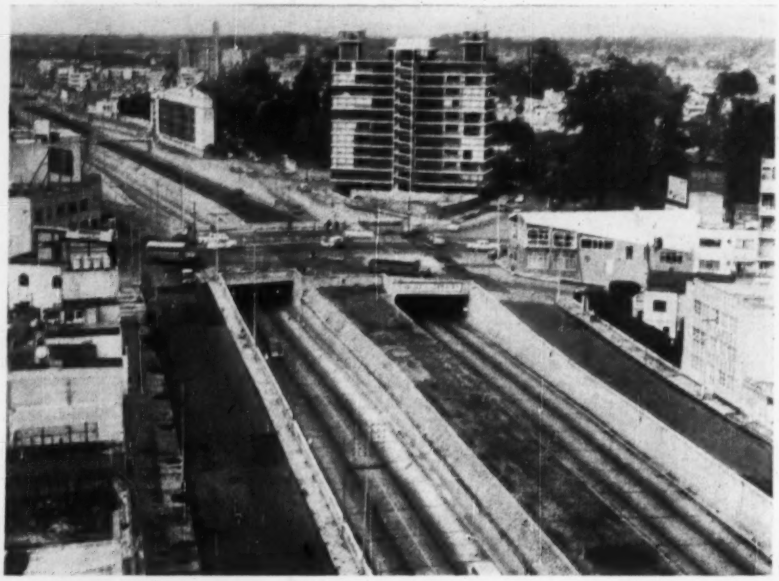
An interesting sidelight is the fact that the new building is a virtual twin of the existing one next to it.

Building 103 is a project of the New York State Department of Public Works. The general contractor is Lasker-Goldman Corporation.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**



**VIADUCTO MIGUEL ALEMAN,** Mexico City's 5 mile long east-west expressway, 90% of which is in an open cut, is helping relieve mid-city congestion.

# Mexico City Expressway

Mexico City's recently-completed crosstown expressway—the five-mile-long Viaducto Miguel Aleman—is helping to solve the capital's rapidly-growing traffic problems.

The road is part of a new system of highways easing east-west passage across the city. This system connects with the highway from Puebla, which enters Mexico City from the east, and with the highway from Toluca, which leads in from the west. On weekdays, these routes handle approximately 40% of all vehicles going or coming from Mexico City.

The Viaducto Miguel Aleman, which can accommodate two lanes of traffic in each direction, has turn-offs leading to principal north-south avenues—most of which have been widened.

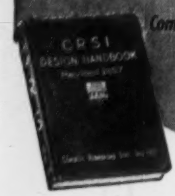
In addition to the east-west system, the overall plan for speeding traffic in and around the city includes two perimeter roads that will be similar to the Viaducto in construction. These traffic rings, under construction, will rim the northern and southern perimeters. The southern section, 26 miles long, will connect with the highway leading to Quernavaca, Taxco and Acapulco. The northern route will link with the highway to northern Mexico and Texas.

Driving force behind this highway construction is Mexico City Mayor Ernesto P. Uruchurtu, who has had the backing of President Adolfo Ruiz Cortines. Both men are to complete six years in office in December, 1958. By that time—and including construction programmed for next year—Mayor Uruchurtu will have spent during his tenure of office nearly $10-million for new roads and maintenance.

A $10 million program for roads in one city is a big one for Mexico. But the capital's growth has been outdistancing road planning. In 1950, Mexico City's population was 3 million—28% of the country's urban population and 13% of the total. In 1957, the capital's 4 million inhabitants comprise 30% of Mexico's urban population and 15% of the total.

In addition, the number of vehicles in Mexico City has soared from 74,000 in 1950 to today's 270,000—and the city is the point of origin or destination of 98% of vehicles traveling over federal highways leading to it. Within the capital itself, transit is further complicated by the fact that industrial areas are springing up in the northern and western outskirts while residential areas are spreading to the south.

A system of subways has been considered ideal for Mexico City, but sponginess of the subsoil would make such a project prohibitively expensive. Meanwhile, with highways such as the Viaducto Miguel Aleman and its connecting rings, city officials are trying to find the answer to traffic problems in surface transportation.



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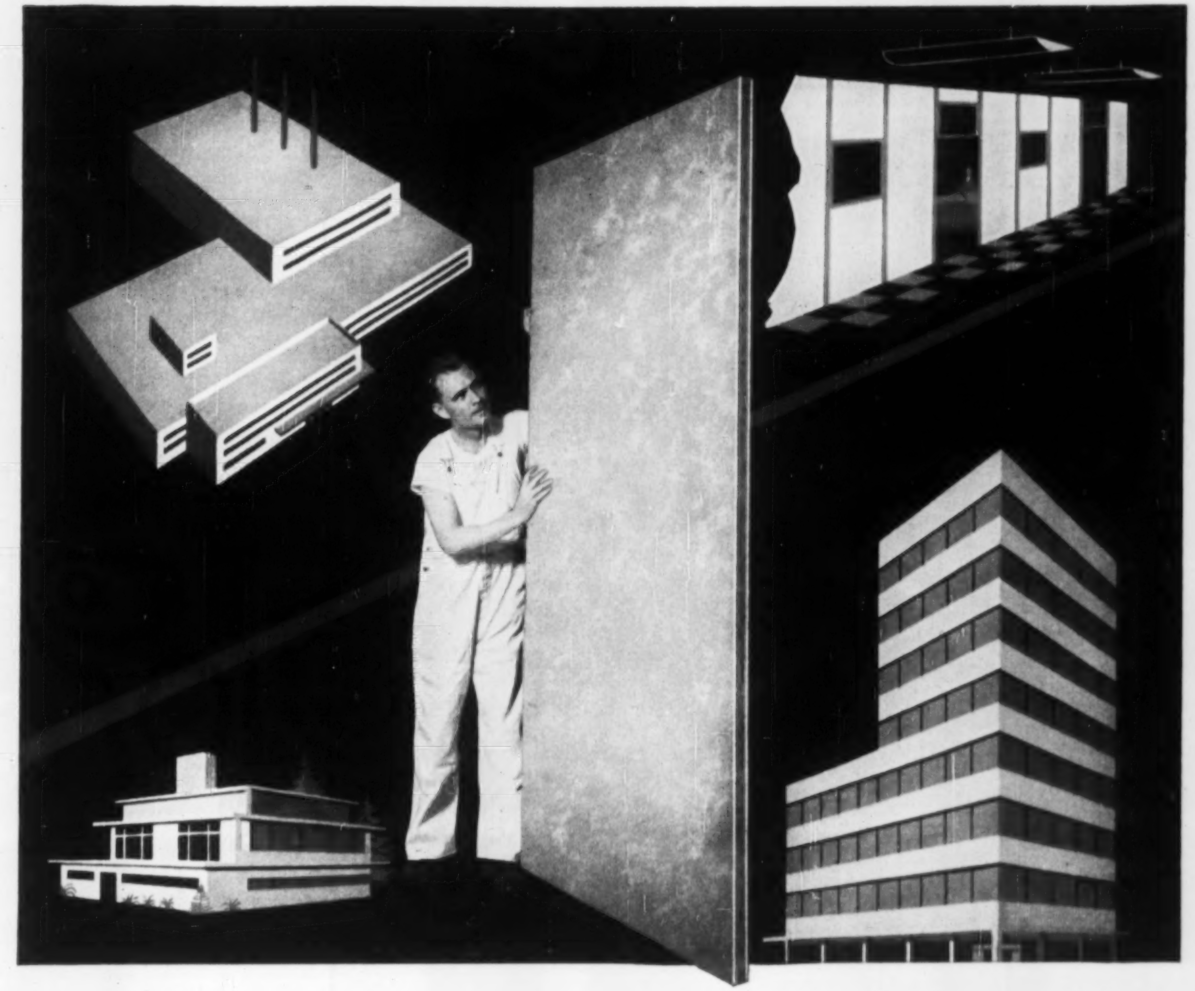


## Panelized walls for buildings—large and small

### Johns-Manville TRANSITOP® panels are strong, weatherproof, save time and money

ARCHITECTS AND ENGINEERS are finding Transitop the ideal material for panel curtain walls in the design and construction of modern buildings. Exterior and interior walls erected with Transitop panels have great structural strength. They are quick and easy to install.

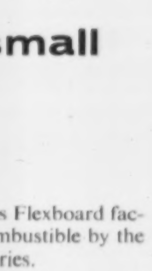
J-M Transitop panels have a highly effective insulating core impregnated to resist moisture and laminated for strength. This core is faced on both sides with strong, tough Asbestos Flexboard®. The insulating core and Asbestos Flexboard are bonded together with waterproof adhesive.

A Transitop 1 9/16-inch thick curtain wall has the equivalent insulation value of a 24-inch thick brick or masonry wall.

Because Transitop panels weigh only 4.7 lbs. per square foot, they reduce the dead load factor. This permits lighter framing and less expensive foundations. This means savings in labor and construction time. In fact, Transitop panels often pay their own costs as a result of the savings they make in total costs of the building.

Transitop panels have excellent wind load resistance, high moisture resistance and they provide maximum insulation value. Also, the Asbestos Flexboard facings are classed as incombustible by the Underwriters' Laboratories.

J-M Transitop is available in panels 4' wide by 8', 9', 10' or 12' long; and 11/16", 1 1/8", 1 9/16" or 2" thick.



Send for free copy of "J-M Asbestos Transitop." Write: Johns-Manville, Box 111, New York 16, N. Y. In Canada, write: 565 Lakeshore Road East, Port Credit, Ontario.

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**PARTICIPANTS** in PHS-sponsored seminar on oxygen relationships in streams, H. W. Streeter, Thomas R. Camp and A. L. H. Gameson of England, discuss . . .

# How a Stream Purifies Itself

"Just about everybody who is anybody in the business" was one participant's apt characterization of attendance at a three day seminar concerned with self-purification of streams held recently at the Taft Sanitary Engineering Center in Cincinnati.

About 150 eminent engineers and scientists gathered at the U.S. Public Health Service's urging to compare notes and chart areas of future research in this highly complex subject, but one which is basic to waste disposal. The most important determinant of the degree of treatment to be given a waste (or of how much untreated waste can be discharged) is the ability of the receiving water to assimilate the waste. This the receiving body accomplishes by biological oxidation—giving up some of its oxygen to stabilize organic wastes. Under the proper conditions, a stream will recover from organic pollution by taking up oxygen from natural sources (mainly the atmosphere). These oxygen relationships—deoxygenation and reoxygenation—occupied the attention of the Cincinnati seminar.

The meeting was focused, appropriately enough, by H. W. Streeter, retired from PHS, who in 1925 with E. B. Phelps, set down the first useful equations expressing oxygen relationships in streams. They define the characteristic dissolved oxygen sag curve of stream, which is formed as the dissolved oxygen (DO) in a stream is first lowered as oxygen is utilized in meeting the biochemical oxygen demand (BOD) of a waste, then rises again downstream of the pollution source through reaeration.

Obtaining reliable reaeration coefficients, or rates, has been one obstacle to efficient use of oxygen sag curves in determining the allowable BOD loading of receiving streams. These rates currently are derived for a particular sketch of river by time-consuming collection of field measurements. Their determination also is complicated by such factors as turbulence of flow and surface active agents (which affect the take-up of oxygen from the atmosphere). Mr. Streeter reviewed these problems at the seminar.

Prof. D. J. O'Connor of Manhattan College attacked the field data problem by reviewing his method of deriving the reaeration coefficient analytically (December, 1956, Journal of the Sanitary Engineering Division, American Society of Civil Engineers). His formula, good for all cases of turbulent flow in rivers, is expressed in terms of depth, velocity and temperature of the stream. Discussors pointed out that to apply the O'Connor formula to oceans and similar bodies, turbulence at the surface should be taken into account.

The other side of the coin—deoxygenation—had some light shed on it by Prof. C. J. Velz of the University of Michigan. He presented studies of several rivers that showed how the BOD load from accumulated organic sludge deposits in riverbeds had distorted DO profiles. Professor Velz suggested that his studies, along with others, could be the initial step in formulating mathematical relationships to determine the oxygen demand of accumulating sludge sediment.

A practitioners' aspect of oxygen relationships in streams was presented by P. D. Haney of Black & Veatch, Kansas City. Pending development of completely satisfactory theoretical methods, the design engineer has to depend on voluminous field data. Mr. Haney called for development of apparatus for continuous measurement and recording of water quality data, especially for DO content.

Also from a design point of view was comment by Prof. G. J. Schroepfer of the University of Minnesota who saw discharge of hot cooling water from power plants as a rapidly growing problem (BOD of a given waste is greater at higher water temperatures due to increased bacterial activity). He cited these figures: in 1940 heat released into streams in the U.S. averaged 24 billion Btu per day. In 1950 the figure was 42.5 billion Btu and in 1955 61.7 billion Btu. Forecast is for 215 billion Btu in 1980 and 388 billion in 2000.

These heat release figures imply that stream pollution will assume more importance in location of power stations.

W. W. Towne, chief of water pollution research at the Taft Center, arranged the seminar.

# The Mackinac Bridge

Only steel can do so many jobs so well

ERICAN BRID
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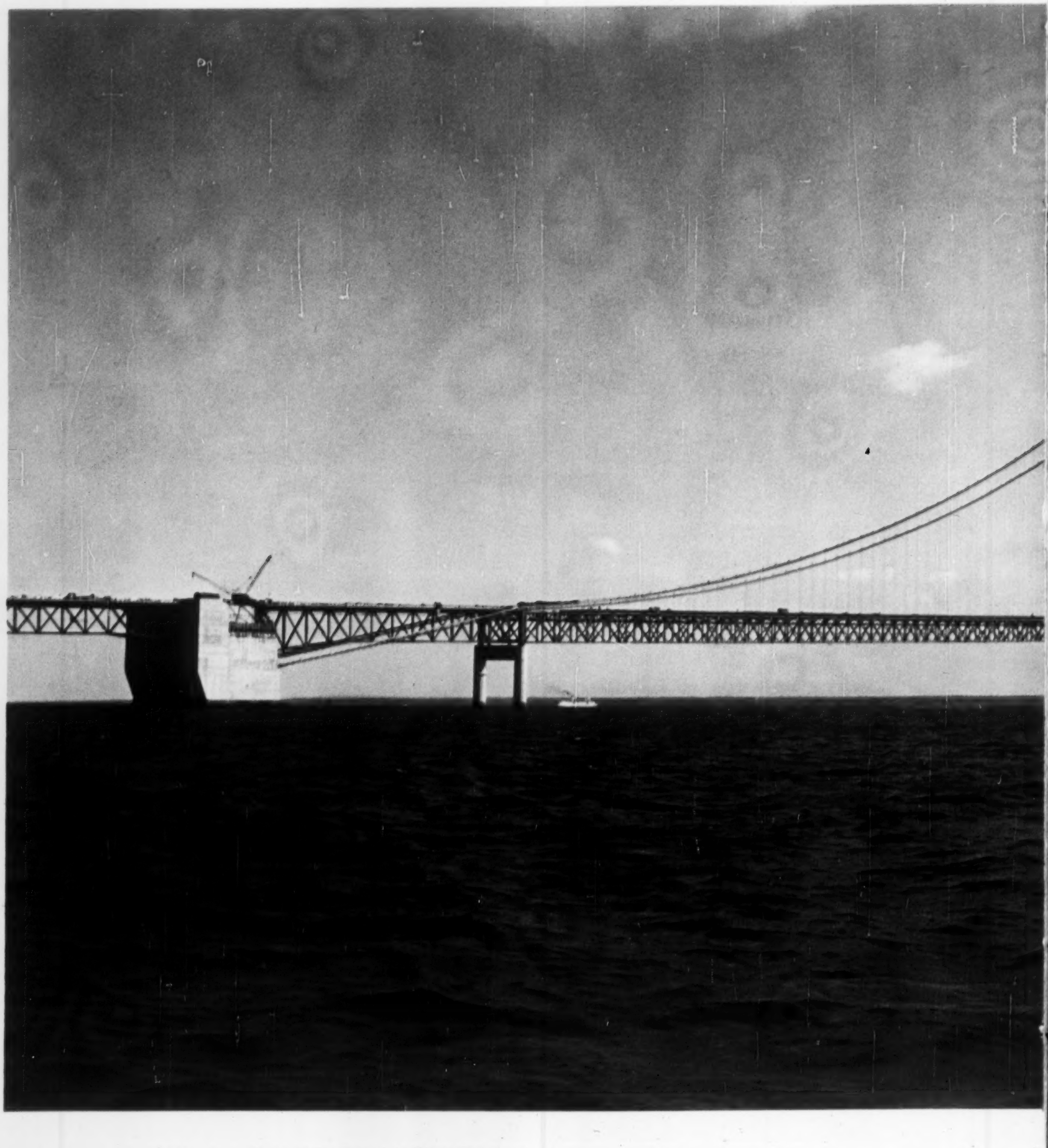
USS UNITED STATES STEEL

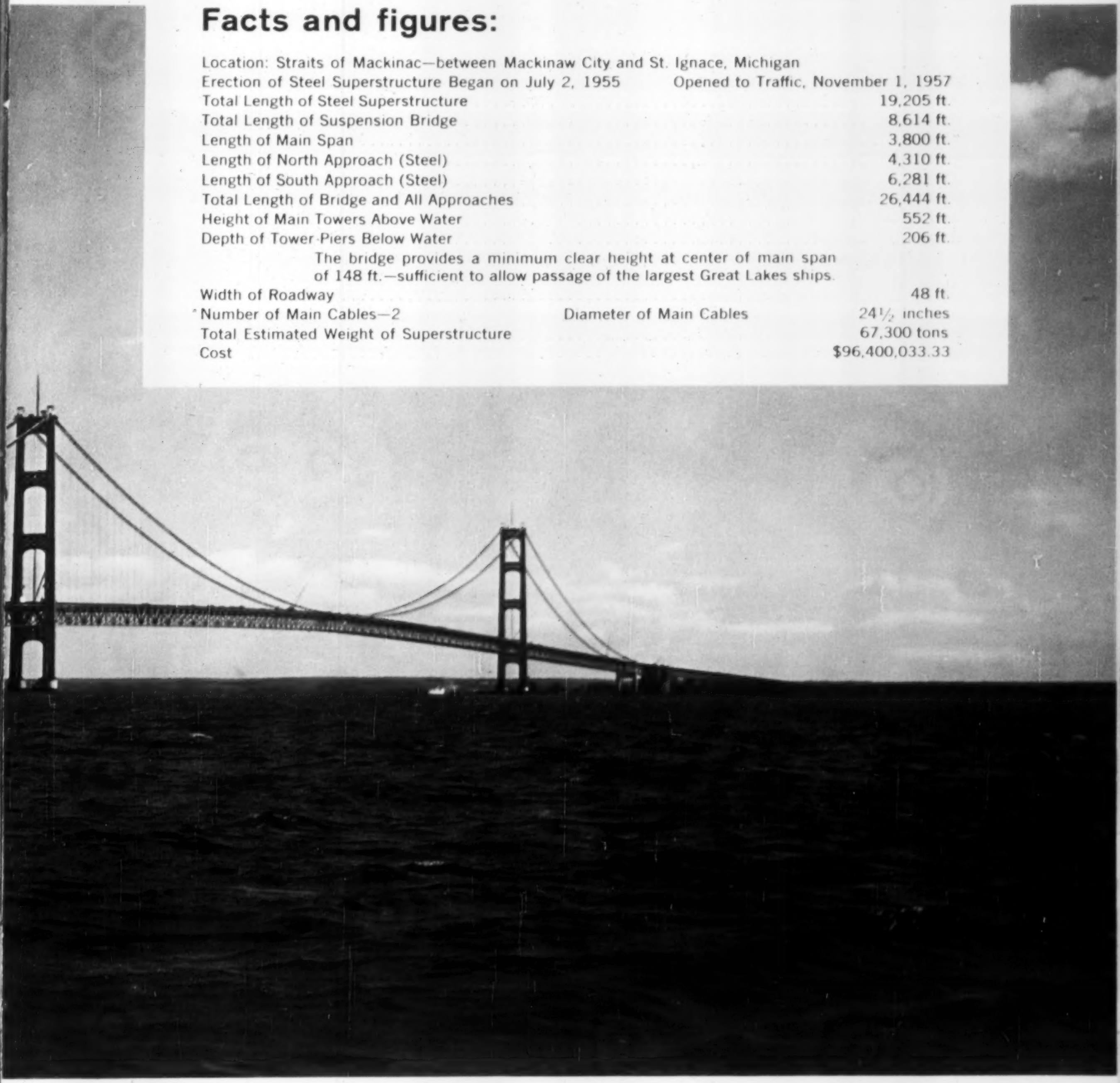
# World's longest suspension bridge



Built for STATE OF MICHIGAN
MACKINAC BRIDGE AUTHORITY

Consulting Engineer: Dr. D. B. Steinman
Associate Consultant: Glenn B. Woodruff
Substructure Contractor: Merritt-Chapman & Scott Corporation

# open for traffic!



## Facts and figures:

Location: Straits of Mackinac—between Mackinaw City and St. Ignace, Michigan

Erection of Steel Superstructure Began on July 2, 1955 Opened to Traffic, November 1, 1957

| | |
|---|---|
| Total Length of Steel Superstructure | 19,205 ft. |
| Total Length of Suspension Bridge | 8,614 ft. |
| Length of Main Span | 3,800 ft. |
| Length of North Approach (Steel) | 4,310 ft. |
| Length of South Approach (Steel) | 6,281 ft. |
| Total Length of Bridge and All Approaches | 26,444 ft. |
| Height of Main Towers Above Water | 552 ft. |
| Depth of Tower-Piers Below Water | 206 ft. |

The bridge provides a minimum clear height at center of main span of 148 ft.—sufficient to allow passage of the largest Great Lakes ships.

| | |
|---|---|
| Width of Roadway | 48 ft. |
| Number of Main Cables—2 | |
| Diameter of Main Cables | 24½ inches |
| Total Estimated Weight of Superstructure | 67,300 tons |
| Cost | $96,400,033.33 |

**Superstructure fabricated and erected by**

**AMERICAN BRIDGE DIVISION**

**UNITED STATES STEEL**

Record-breaking use of USS AmBridge

. . . trims 8,720 tons of dead weight . . . speeds bridge

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USS

# I-BEAM-LOK flooring

## completion . . . provides weather-free traffic lanes

In character with the rest of the job, the flooring of the world's longest suspension bridge also exemplifies bold engineering and effective use of materials.

By covering the entire suspended roadway with lightweight I-Beam-Lok:

. . . floor weight was more than cut in half

. . . the bridge was open to traffic months earlier

. . . weather-free traffic lanes and improved aerodynamic stability were secured

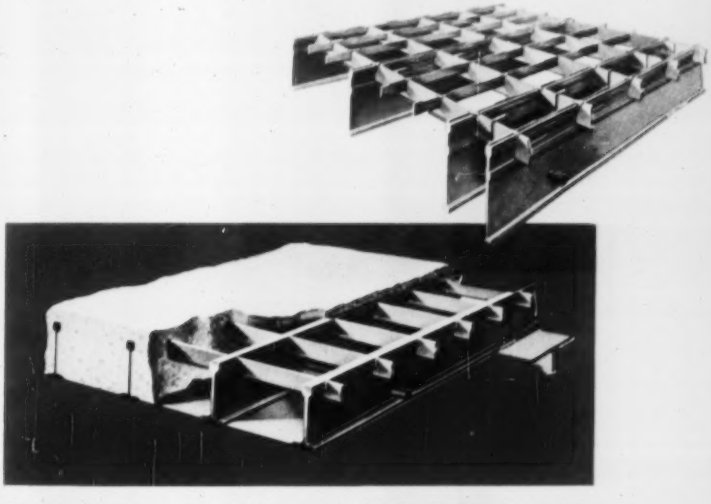
**Here are the details:**

The suspended roadway is comprised of two inner lanes 7,400′ x 11′, two outer lanes 7,400′ x 12′, and a 7,400′ x 2′ median strip—362,600 sq. ft. in all. Using 5″ PL-Type, Open I-Beam-Lok on the inner lanes and median strip, and 4¼″ filled I-Beam-Lok on the outer lanes, total floor weight was 7,597 tons as compared with 16,317 tons had conventional flooring been used.

Weight saving is only part of the story. Time was also a vital factor, and there is no doubt that the speed with which I-Beam-Lok could be installed, and the ideal working platform it provided, permitted the bridge to be opened and start paying for itself months earlier.

And finally, the open I-Beam-Lok invites both snow and wind to go right on through, assuring good driving conditions during howling Mackinac winters when snow would pile up on a solid floor, and preventing the build-up of dangerous wind pressure.

While this job represents the biggest use of I-Beam-Lok ever, the product's many advantages apply to bridges of all sizes—for new installations or reflooring. For catalog, write to our headquarters in Pittsburgh.



**USS AmBridge I-BEAM-LOK lightweight steel flooring**

# What supports the roadway of the

## 41,000 miles of Tiger Brand cable wire
## and
## 100,012 feet of wire rope suspenders

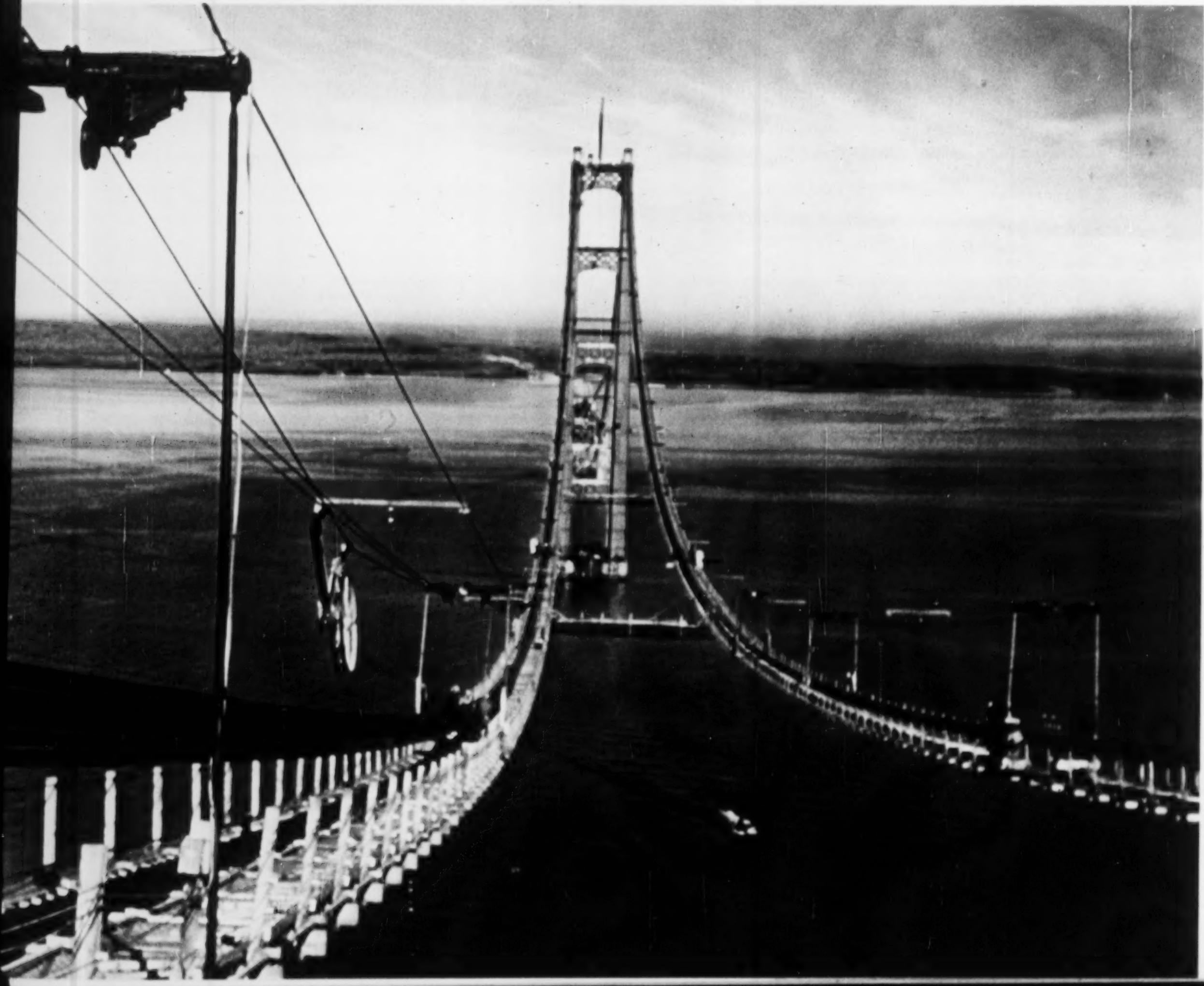
Spinning the main cables for the Mackinac Bridge is similar to stringing a clothes line on a giant scale. You fasten one end of a high-strength galvanized wire to a hook in an anchorage ⅓ the playing area of a football field. Loop the wire over a pulley and haul it over two towers as high as 46-story buildings. Fasten the wire in another anchorage over 1½ miles away. Then shuttle the pulley back and forth until you build up a cable more than two feet in diameter. Two of these cables form the double backbone of the bridge.

These cables support the entire roadway of the suspension section through 368 vertical suspenders made from 2¼-inch-diameter Tiger Brand Galvanized Bridge Rope. These have a breaking strength of 235 tons each and are pre-stressed to remove structural stretch.

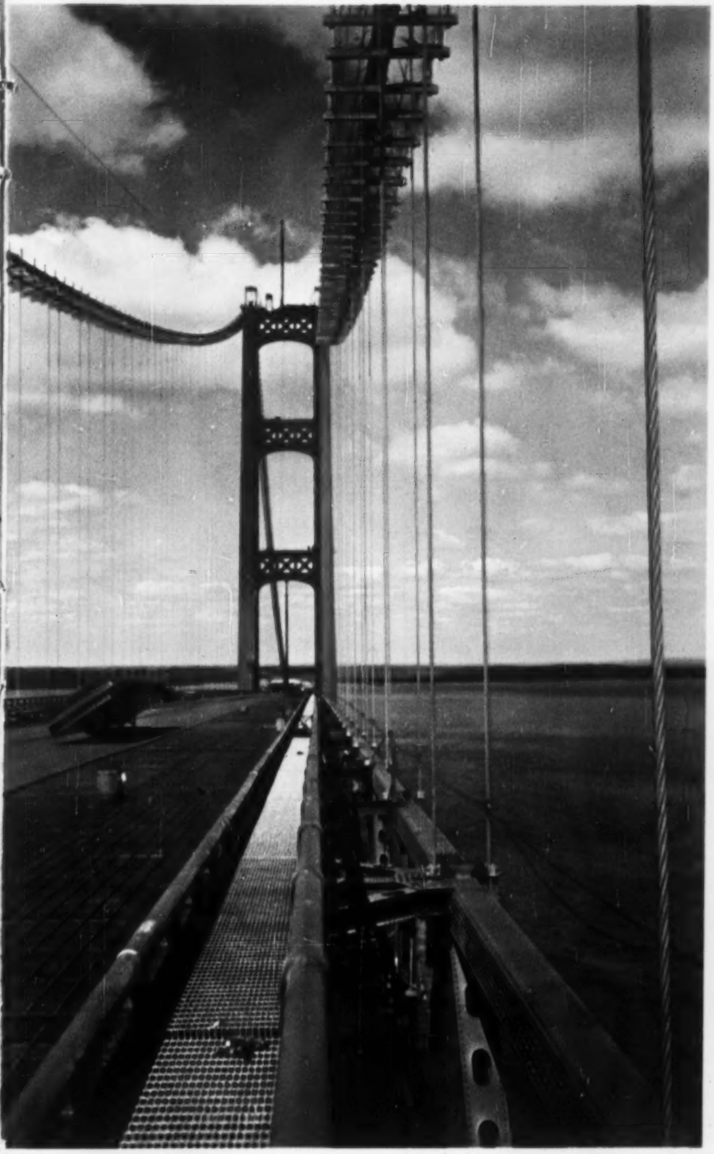
After the suspenders are attached, the main cables are wrapped with more galvanized wire as a final protection against the weather.

Look through the pictures and you will see what an important part high-quality wire plays in the construction of this great suspension bridge—the longest in the world. And remember that all the wire and wire rope was supplied by American Steel & Wire Division, United States Steel.

**Key step is the spinning operation.** Four spinning wheels, like the one shown here, haul the cable wire from anchorage to anchorage—a distance of 8,614 feet. Each wheel pulls two loops, or four wires. The completed main cable contains 12,580 separate wires and is two feet in diameter. The two cables weigh 11,500 tons.



# Mackinac Bridge?



**Spider web of suspender cables.** These vertical suspenders of 2¼ inch diameter Tiger Brand Galvanized Bridge Rope support the bridge floor. A total of 100,012 feet were used in the completed bridge.

**Compacting a strand.** High above the Straits of Mackinac, these workmen wrestle with a bundle of wire. They clamp 340 wires into a single strand. It takes 37 such strands to make one finished bridge cable.

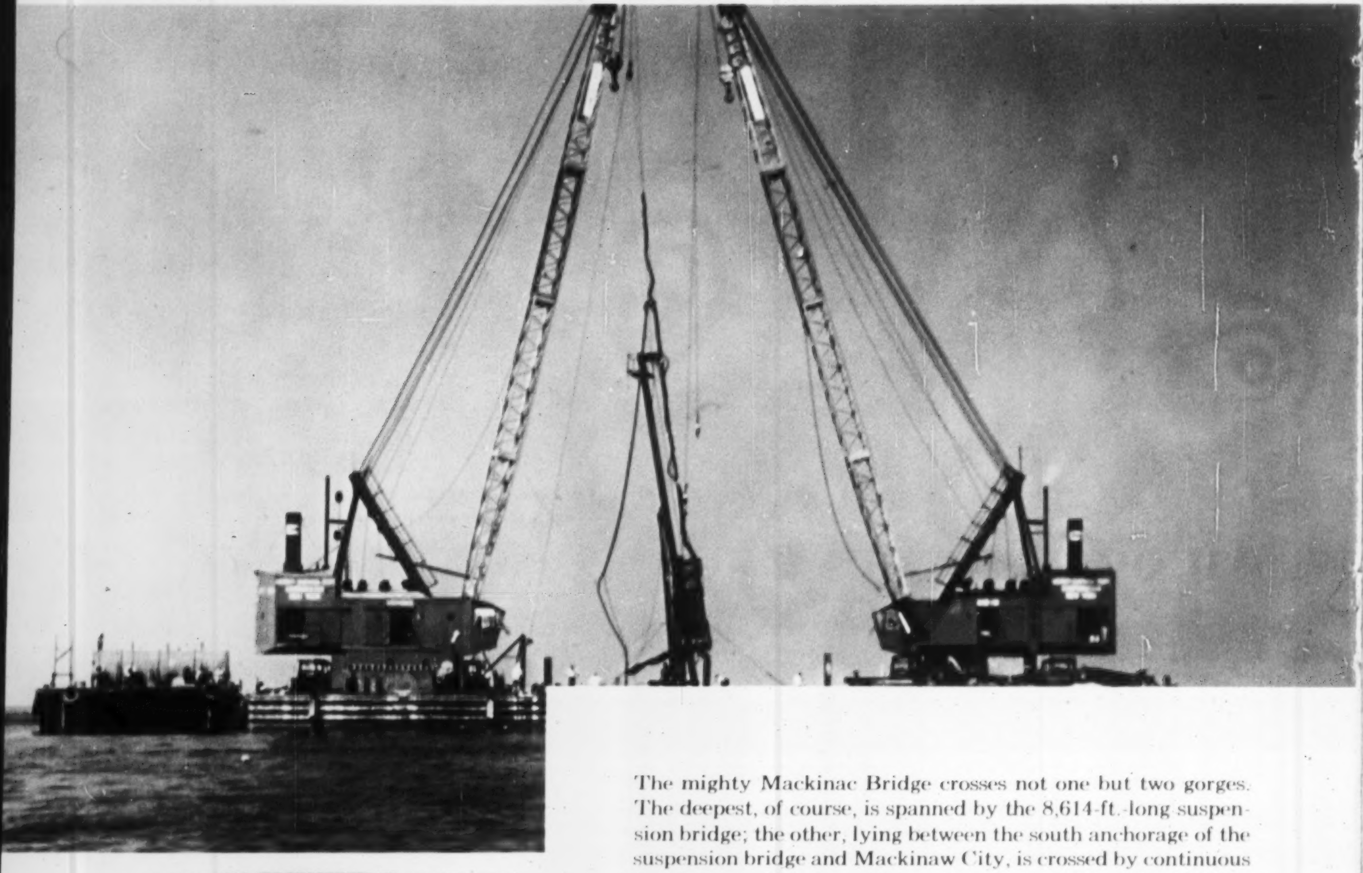
**The start of a main cable.** Immense reels feed cable wire, about one-fifth inch in diameter, to spinning wheels shuttling across the bridge. Each reel holds 330,000 feet of American Galvanized Steel Wire. The finished bridge required 700 reels of wire.

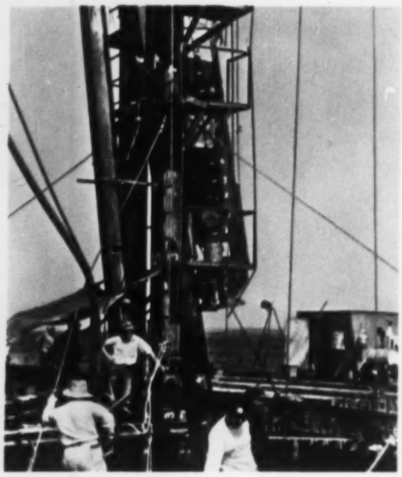
## USS American Tiger Brand Wire Rope

**AMERICAN STEEL & WIRE DIVISION,** United States Steel
General Offices: Cleveland, Ohio

USS

# 4,767 tons of USS H-Beam Bearing Piles provide firm foundation for deep piers!





The mighty Mackinac Bridge crosses not one but two gorges. The deepest, of course, is spanned by the 8,614-ft.-long suspension bridge; the other, lying between the south anchorage of the suspension bridge and Mackinaw City, is crossed by continuous truss spans. This secondary gorge is approximately 3,500 ft. wide and reaches a depth to rock of 174 ft. below lake level.

Seven piers founded in this secondary gorge and one near the shore at the north (St. Ignace) approach are supported on 4,767 tons of Steel H-Beam Bearing Piles furnished by United States Steel. Some of these bearing piles—all of which are 14″/117-lb. piles—are driven 110 ft. to firm foundation. They support piers built in circular cofferdams to a depth of 82 ft. below lake level. The pictures here show the construction at pier No. 11 which was founded on 172 USS H-Beam Bearing Piles.

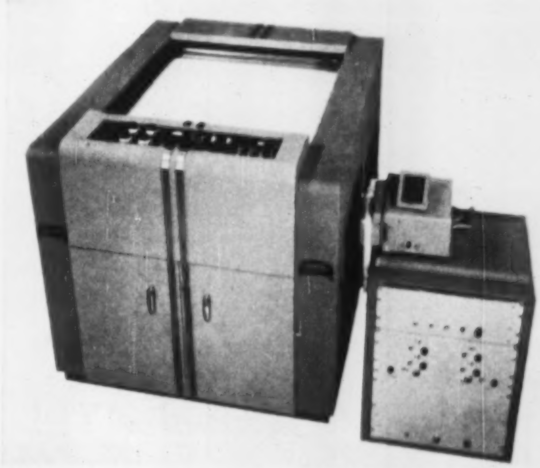
Merritt-Chapman & Scott Corporation constructed the substructure which comprised the foundations, piers and anchorages for this record-breaking bridge.

USS

United States Steel Corporation, Pittsburgh, Pa.
Columbia Geneva Steel Division, San Francisco · Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Export Company, New York

**UNITED STATES STEEL**

**ELECTROPLOTTER** is name of Benson-Lehner Corp. machine which will draw lines automatically.



**DATAPLOTTER** is what Electronic Associates Inc. calls its competitive and very similar product.

# Automatic Line Plotters Are Unveiled

The first automatic line plotters ever made were unveiled before the recent National Conference on Highway Engineering Productivity in Boston (ENR Sept. 26, p. 21). They were developed simultaneously by two manufacturers, both of which were responding to the specific requirements of the civil engineering field, particularly the highways phase.

Heretofore, only point-by-point plotters were available. Now with a means of automatically connecting the points (by straight lines, only), civil engineers foresee great application of the plotters—for highway cross sections, road profiles and horizontal alignments, mass diagrams, traverses. On the horizon is the plotters' application to ordinary engineering drawings. This would require expression of drawings in digital form (x and y coordinates of the intersection of lines).

One of the line plotters has been named the Dataplotter (Model 3033B-2) by its maker, Electronic Associates, Inc., Long Branch, N. J. Its plotting table measures 30 x 30 in. The manufacturers claim a plotting speed of up to 60 points a minute depending on the distance between them, and an accuracy of .015 in., approximately the thickness of the plotting pen.

The machine can be fed digital information from punched cards, punched paper tape or from a manual keyboard. It can accept up to four digit numbers, expressed in simple decimal form or in binary code (from electronic computers).

Handy for producing several highway cross sections on one 30 x 30 in. sheet of paper (or without having to move a paper roll) is an incremental advance accessory which will automatically advance the X-axis a preset increment.

The second line plotter on exhibit in Boston was the Electroplotter (Model II) made by Benson-Lehner Corp., Los Angeles. Basically, it is very similar to its competitor, having the same type of feed, the same size plotting table, and similar plotting speeds and accuracies.

The Electroplotter differs slightly in that it is 40 x 40 x 33 in. high and is equipped with a separate control console 25 x 24 in. in plan and 68 in. high. The Dataplotter has more of its controls in the plotting unit which measures 44 x 51 x 42 in. high.

Both machines are listed in the same price range, about $22,000. And both require digital input devices (such as paper tape reader, card punch, etc.).

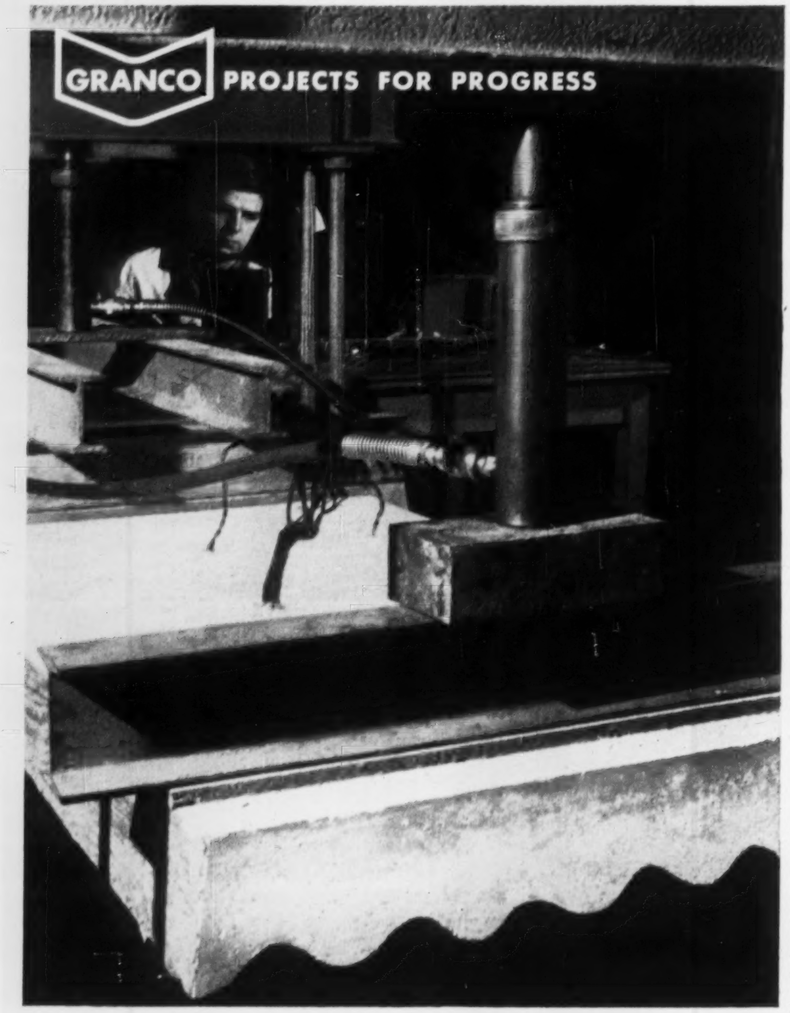
## Portable Screening Plants Added to Line

Two new portable aggregate screening plants are said to be designed for a high rate of production.

The new models, numbers 366 and 488, consist of a single-deck buzzer screen and reciprocating plate feeder, permanently mounted on a lattice frame conveyor installed on a hydraulic cradle truck.

The Model 366 has a 3 ft x 6 ft screen, the Model 488 has a 4 ft x 8 ft screen. Pioneer Engineering, Minneapolis 14, Minn.

*(New Products continued on page 70)*



# "CARDIOGRAPH" FOR A CONCRETE SLAB

**Sensitive stress-measuring device proves the strength of a Cofar floor system, . . . helps speed better products to you.**

Operating like a cardiograph that records the strength of a human heart, the 50 strain gages buried in the concrete slab, above, measure the amount, location and direction of stresses that result when loads are applied to the slab. This precision device is one of many experimental rigs used by the research laboratory at Granco Steel Products Company. This laboratory develops better Granco products for the construction industry and provides data that enables architects and engineers to use these products with *predictable* results. Here, we're testing the strength of a Cofar reinforced-concrete floor system in which form and reinforcement are combined in one operation.

*Like to see the results of this test? We'll be happy to send them to you, absolutely free, if you'll drop us a card today. This is the story of Granco product research . . . the right road to progress.*

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**A Subsidiary of GRANITE CITY STEEL CO.**
*Distributors in 80 Principal Cities*

GRANCO

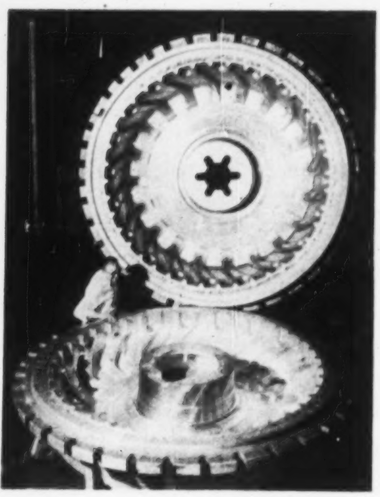
SINCE GRANITE CITY STEEL 1878

## New Crawler Tractor Added to Oliver Line

Another new crawler tractor has been added to the Oliver line with production of the Model OC-15.

A high-torque, six cylinder diesel of 529 cu in. displacement delivers 75 hp (drawbar). The crawler has four forward gear speeds ranging from 1.67 to 5.60 mph providing wide speed selection. For rapid maneuverability, there are reverse gear speeds of 1.99 and 4.48 mph. Controls have new grouped design for simplicity and ease of operation.

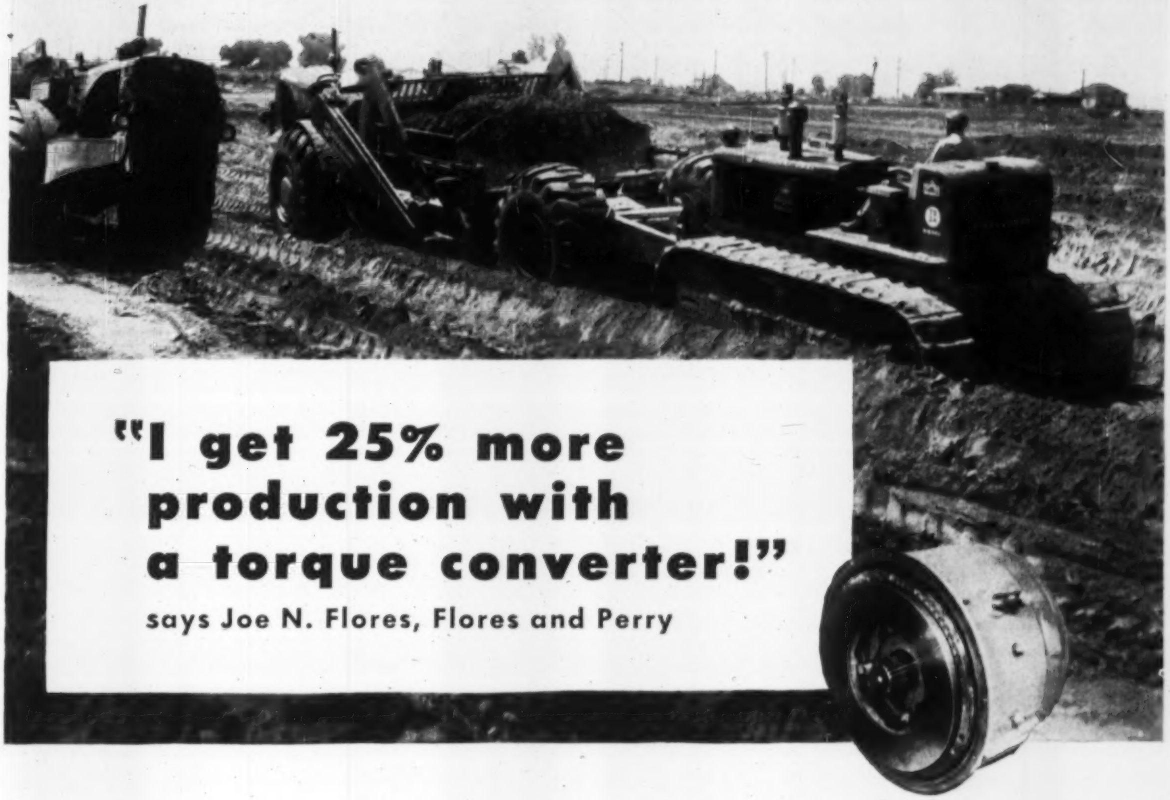
Operating weight is approximately 16,960 lb and over-all length is 128 in. There are six lower and two upper track wheels. With standard 16 in. track shoes, there is a total ground contact area of 2,808 sq in. THE OLIVER CORP., 400 W. MADISON ST., CHICAGO 6, ILL.



## Aluminum Molds Will Turn Out King-Sized Tires

Twin aluminum tire mold sections comprising the largest light metal castings in the world are being readied for production of mammoth tires for the construction industry.

Aluminum Co. of America's Cleve-



# "I get 25% more production with a torque converter!"

says Joe N. Flores, Flores and Perry

Working on an 8-mile grade-raising job on Central Valley Highway south of Hanford, California, a torque converter equipped International TD-24 is push-loading two "75" Payscrapers to the tune of 20 cu. yd. heap loads in only 42 seconds!

Production? You bet! And here's the reason for it:

"Our torque converter equipped TD-24 Tractor gives 20 to 25 per cent more production than comparable mechanical drive units!" says Joe N. Flores, of Flores and Perry, the contracting firm operating the TD-24. "That's not all, either," Mr. Flores goes on. "We estimate the torque converter drive improves service life by something like 25 per cent!"

Here's how the torque converter does it: It multiplies engine torque up to 6:1 when required. It permits the engine to deliver constant high horsepower output. It automatically matches power to load demands, with gear-shifting minimized or eliminated, for increased operator efficiency. Heavy load pick-up is smooth and even, without clutch slippage. Shock loads and vibrations are cushioned out through the converter's fluid connection, for long tractor life and minimum maintenance. An infinite variety of torque ratios is available to work with, permitting smooth, safe, accurate control of loads.

Leading tractor manufacturers today offer torque converter drives as standard or optional in various models . . . and standardize on Twin Disc torque converter components for maximum performance and proven dependability.

See your dealer now for complete information on torque converter equipped machines. Try one on your next contract and you'll agree with what leading contractors everywhere are saying: The torque converter drive is the wisest, most profitable investment you can make in a heavy-duty machine!

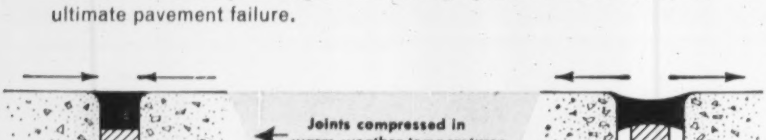
Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

**TWIN DISC**
**Torque Converters**

Special Joint Sealing Compounds
resist damage caused by
Aircraft Fuel Spillage

keeps joints in airport concrete safely sealed under all conditions

The deteriorating effect of aircraft fuel and other petroleum solvents which come in contact with ordinary joint sealing material used on concrete runways, aprons and taxi strips, causes serious pavement damage and expensive maintenance. Once the seal of an expansion, contraction or dummy joint is broken the infiltration of water and foreign materials into the joint begins the damaging action which results in ultimate pavement failure.


Joints compressed in warm weather temperatures.
Joints opened in sub-zero temperature.

The development of two special sealing materials—Hot Poured Para-Plastic® JF and Cold Applied Zero-Lastic® JF—which are impervious to petroleum solvents and are unaffected by extremes of temperature, has eliminated the damage caused by spillage of jet fuel and other petroleum solvents.

Both materials form a resilient and adhesive seal which maintains bond with the concrete at sub-zero temperatures. Their stability is constant and they will not become soft and fluid during high summer temperatures. (See drawings above.)

Hot Poured, Para-Plastic JF and the cold applied Zero-Lastic JF are widely used, not only in new construction, but in maintenance of old concrete pavement as well. Both compounds can be pumped into the joint with readily available equipment. Hot Poured Para-Plastic JF meets Federal Spec. SS-S-167, and Cold Applied Zero-Lastic meets Federal Spec. SS-S-170.

For more details on Hot Poured Para-Plastic JF and Cold Applied Zero-Lastic JF, write the manufacturer:

SERVICISED PRODUCTS CORPORATION • 6051 West 65th Street • Chicago 38, Illinois

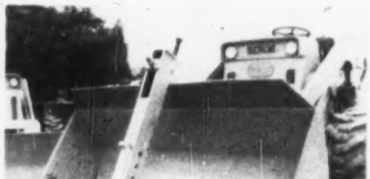
land foundries cast the two mold back-up sections for Goodyear Tire & Rubber Co. and they now are being installed at one of the rubber firm's plants.

The molds have a combined weight of almost 8 tons and are 8 ft 10 in. in outside diameter. Casting section thicknesses range from 3½ to 10 in. Tires almost 7½ ft in diameter and weighing 2,500 lb will be cured in the molds.

## New Blast Hole Drill

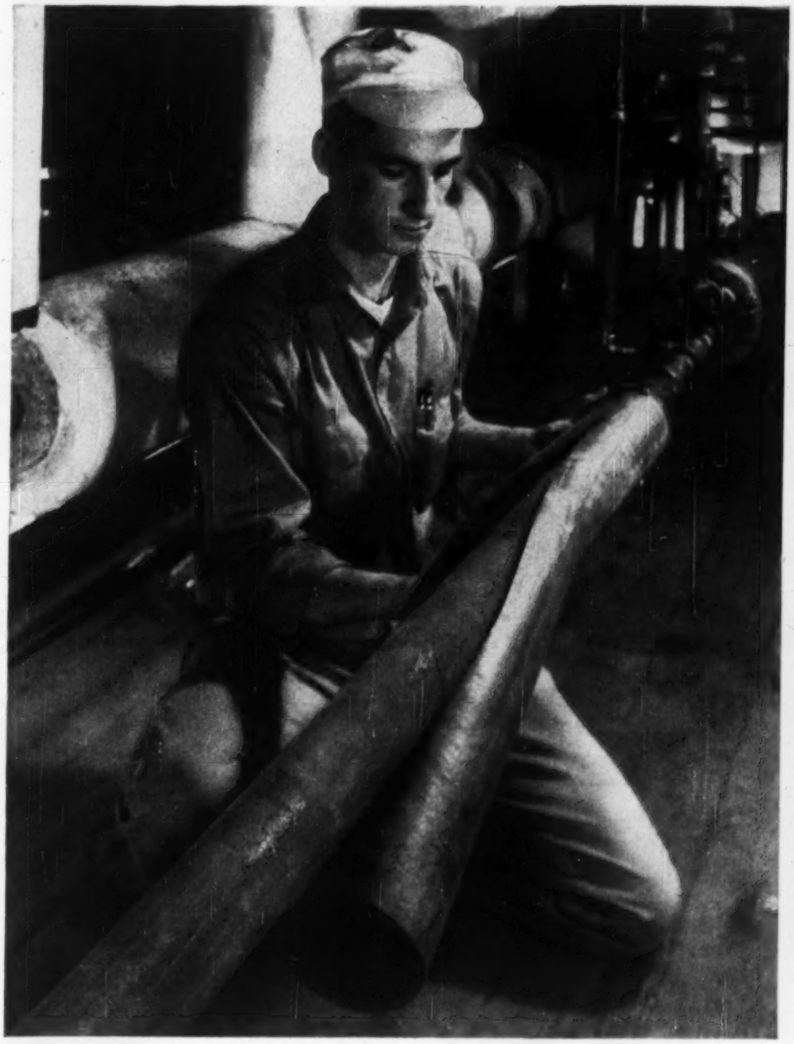
The new Joy Model 125 rotary blast hole drilling rig can be either truck or trailer mounted and powered by either the truck engine or an auxiliary unit.

The 125 is equipped with double drum drawworks mounted on a common shaft, a hydraulically raised and lowered mast. Joy Manufacturing Co., Oliver Building, Pittsburgh 22, Pa.

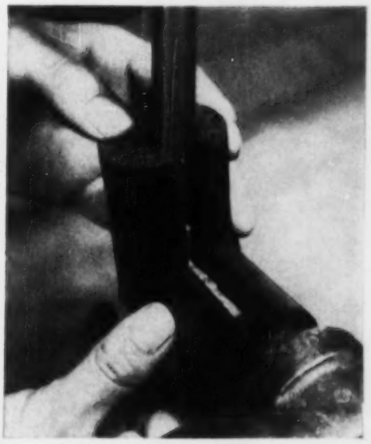


## Tractor-Shovel Ripper

A new model R-24-75 Ripper for use with rubber-tired tractor-shovels in the 1 to 2½ yd class now is available. It has a 3 in. x 6 in. ripping shank, with a replaceable 18 lb cast manganese tooth. The Ransome Corp., 2729 Hunting Park Ave., Philadelphia 29, Pa.



**Stop condensation** on fluid lines with economical, easy-to-apply Armstrong Armaflex.



**Fast, easy fabrication** of fitting covers is done by miter-cutting pieces of Armaflex Pipe Covering and cementing them together with Armstrong 520 Adhesive.

**Sleeving a flange** or screwed fitting is easy with new Armstrong Armaflex Pipe Covering or Sheet Insulation. Simply cut a piece of proper size and seal it in place with Armstrong 520 Adhesive.

# New insulation goes on fast over cooling and heating lines

New Armstrong Armaflex® helps you cut installation time as much as 50% on air-conditioning, heating, and hot and cold water lines.

When lines are already installed, pieces of Armaflex slit lengthwise are snapped over the pipe and sealed with Armstrong 520 Adhesive. Chillers, water tanks, and large diameter piping are insulated with sheets of Armaflex adhered with Armstrong 520 Adhesive.

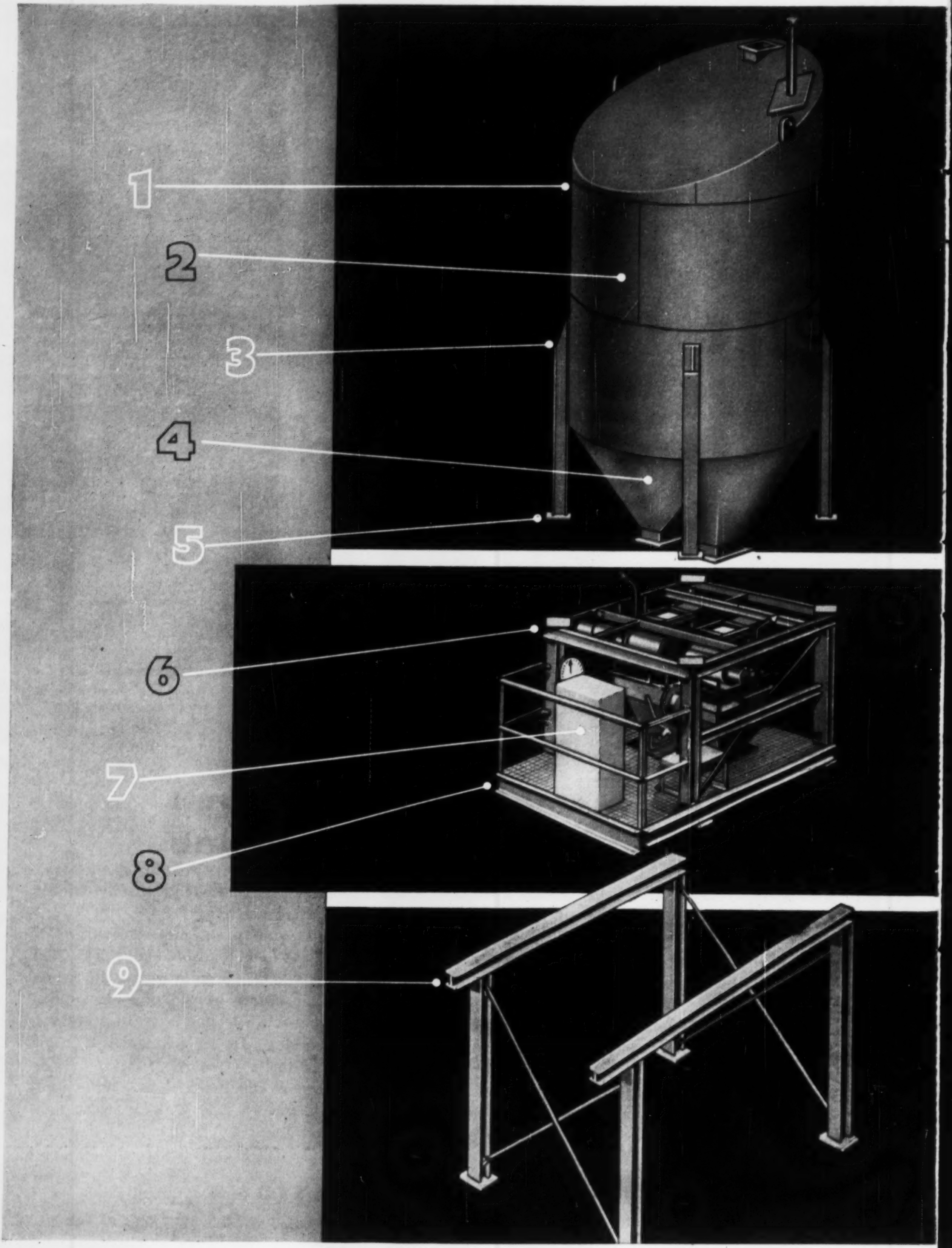
Unslit tubes of Armaflex Pipe Covering can be slipped right over pipes and copper tubing before installation. Because Armaflex is highly flexible, it follows contours, curves, or bends readily without any special cutting or fitting.

Armaflex is a foamed plastic insulation with a low k factor of 0.28 at 75° F. to assure ample protection against condensation. Clean to work with, Armaflex will not chip, crumble, or rub off. Available in 6′ lengths, nominal ⅜″, ½″, and ¾″ wall thicknesses, for pipes and tubing up to 3½″ o.d., and in 30″ x 36″ sheets, up to ⅞″ thick.

**Free booklet** gives complete details. Write Armstrong Cork Company, 2211 Wallace Street, Lancaster, Pennsylvania.

**Armstrong INSULATIONS**

*for temperatures from −300° F. to +2000° F.*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*Designed especially for highway and airport work—it is the fastest, most accurate and portable plant of its kind*

# Heltzel's outstanding portable cement plant

● For the first time a batching plant that combines true portability with amazing accuracy and ultra high speeds.

Here's the cement plant engineered specifically for the highway and airport builder to deliver specification batches as fast as they can be handled—a plant that can be erected or dismantled in minutes by a skeleton crew, transported over existing roadways on standard truck equipment.

The unitized plant is fabricated in three easy to handle sections with instantaneous couplings for manual or automatic installation. The Bin Section (1) is completely factory assembled in capacities from 230 bbl. to 670 bbl. Of all welded heavy plate construction (2) the design utilizes rugged, wide flange beam columns (3). Single or double outlet (4) available for single, dual or twin batchers. Column connectors (5) are extra large for easy spotting and rapid assembly.

Batching or intermediate section (6) comes completely assembled with single, dual or twin batchers, fully automatic or manual, including the exclusive combination gravity and rotary vane cement feeder that means much faster charging with unmatched precision or the outstanding Heltzel tubular cement valve that can't freeze-up or jam.

It features the popular ultra-high speed Heltzel weighing system (7). Where desired a factory assembled platform extension (8) with metal decking is available. Support section formed of rugged, yet easy to handle wide flange beams (9) with bracing furnished for drive through in either direction. Elevators (not shown) are manufactured to move from 150 bbls. to 500 bbls. per hour with installations for either railroad or cement truck delivery.

You'll want to know more about this portable plant that works with all the speed and accuracy of a modern stationary plant. Contact your Heltzel representative or write direct.

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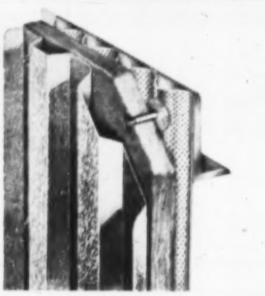
## Another Maintenance-Saving Installation by American Can Company!

# Reyconowall®

## Reynolds Aluminum Field Assembled Curtain Wall System

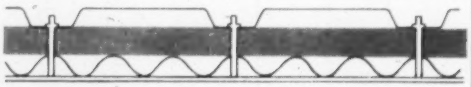
**American Can Company**
Coil Cutting Plant, Hillside, N. J.
**Jobber-Erector:**
Donovan Erection Company
**Materials:**
Exterior Sheet—Reynolds 4" rib, .032" thick.
Insulation—1 1/2" glass fiber board.
Interior Sheet — Reynolds Aluminum Industrial Corrugated, .024" thick, embossed and perforated.

This 42,000 sq. ft. installation demonstrates a new and important advantage of REYCONOWALL—sound conditioning! Here the interior sheet is perforated so that, together with the glass fiber backing, it provides excellent noise reduction. This is in addition to the other well established benefits of REYCONOWALL—speedy, low-cost erection; the high insulation value of two radiant heat reflective aluminum sheets plus the glass fiber; minimum maintenance because aluminum cannot rust, resists corrosion, needs no painting. This is American Can Company's third plant using this highly efficient, low-cost curtain wall system.



Above is a cross section of *Reyconowall* as used in American Can Company's Hillside plant.

Profile below shows *Reyconowall* with 8" rib siding (available both .032" and .040" thick). Exterior and interior may also be Reynolds Aluminum Industrial Corrugated.

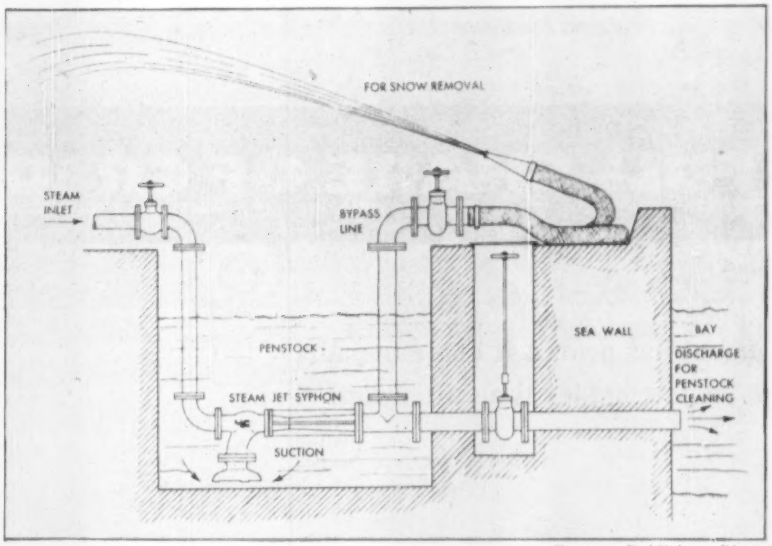


**A complete installation service is available. For name of the nearest franchised Jobber-Erector, call the Reynolds office listed under "Building Materials" in classified phone books of all principal cities. Or write to Reynolds Metals Company, Building Products Division, Louisville 1, Ky.**

Watch Reynolds all-family show, "Disneyland", ABC-TV Network.

# REYNOLDS ALUMINUM

## BUILDING PRODUCTS



*Eastern Publishers Photo*

## Steam Jet Siphon Doubles in Duty

A steam jet siphon is being used to remove water and sludge from a penstock. It costs the Gillette Safety Razor Co. about $120.00 a year. Installation ran to approximately $500.00.

Part of the installation is a 5 in. steam jet siphon mounted in a horizontal position with clearance for a short run of suction piping. Steam at 175 lb pressure is introduced at the inlet nozzle. This entrains penstock sludge and water and discharges into a tidal bay.

The company gets still another use out of the jet siphon. As much as 500 ft of 3 in. fire hose can be connected to quickly melt and wash away snow accumulations on its parking lot.

**Stripped down paver-finisher . . .**

*Photos courtesy Blaw-Knox Co.*

**. . . and a winch are used . . .**

## To Coat Reservoir Slopes as Fast as Base

A stripped down paver-finisher was used to lay a 4 in. thick bituminous surface on the 2:1 slopes of two 6 million cu ft water basins at the El Centro, Calif., Water Treatment Plants.

Contractors for the job, Basich Brothers, San Gabriel, Calif., stripped a paver-finisher to allow full use of only the screed arms, screed and tamper. With a separate engine installed to drive the tamper, the assembly was pulled up the slopes by a winch at the top of the reservoir.

The coated slopes were then rolled with the front wheel assembly of a tandem roller pulled by a winch.

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*Partners Joe Duncan (left), and Johnie Arnett, Corsicana, Texas.*

# "THEY GET A FULL SHARE OF CREDIT

**Our Allis-Chalmers equipment has proved it can move dirt at low cost . . . and let us be low bidder time after time"!**

*Joe Duncan*
*Arnett & Duncan*
*Corsicana, Texas*

Now building their 19th earth-fill soil conservation dam, Arnett & Duncan operate an equipment spread that includes both Allis-Chalmers motor scrapers and crawler tractors.

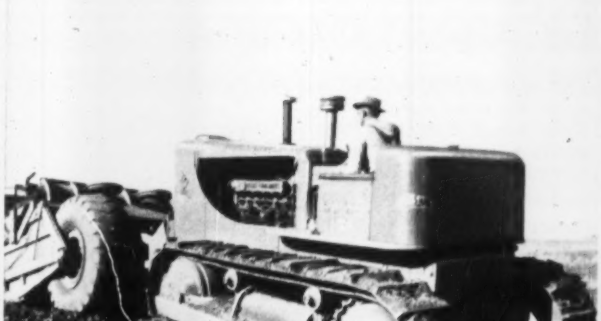
"With our Allis-Chalmers equipment, we can dig, haul and place dirt for a lower-per-yard cost . . . move as much dirt as higher-rated-capacity units," says Mr. Duncan. "The maneuverability and speed of our TS-360's and TS-260's cut cycle time, and the curved bowl bottom feature has brought a real boost to loading efficiency. Incoming dirt breaks up and rolls into the bowl for larger heaped loads.

"Our operators like our Allis-Chalmers equipment, too, because of the operating ease, riding comfort. You get a lot more production when your crew likes the equipment."

**TS-360 motor scrapers** (15 yd struck; 20 yd heaped), like that shown at left, are the "big guns" of the Arnett & Duncan fleet on earth-fill dam construction. Working with the TS-260's (11 yd struck; 14 heaped), they help make a high-production, low cost-per-yard team.

**Top crawler tractor** for these go-getting Texas ▶ contractors is the Allis-Chalmers HD-21—a product of 17 years of torque converter experience.

FOR OUR SUCCESS



Find out for yourself how the productivity of Allis-Chalmers construction machinery can help improve your profit picture as it has for these Texas contractors. Ask your dealer for all the facts—and a demonstration of real dirt-moving efficiency. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

**ALLIS-CHALMERS**

*Engineering in Action*

# Keep plant space flexible with BLAW-KNOX Electroforged® Steel Grating

If expanding production set-ups are cramping feeder and storage areas in your plant, it will pay you to check into Blaw-Knox Electroforged Steel Grating.

Storage platforms of Blaw-Knox steel grating put unused space to work easily, economically. There's nothing to wear, nothing to patch. Blaw-Knox Electroforged grating fits neatly around pipes, beams and machinery without any alterations to the building, and, at the same time, admits maximum light and ventilation to the entire area.

Blaw-Knox Electroforged Grating for walkways, stair treads and floors is fabricated to your specifications to meet your own operating conditions. Complete data on all types is contained in Bulletin No. 2527. Write for your copy today.

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## BLAW-KNOX COMPANY

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*Equipment Division*
*Dept. A, Pittsburgh 38, Pa.*

Raymond Concrete's Maxwell M. Upson . . .

# Fifty Years at the Top

Recently, a bouquet of rare flowers, 4 ft high, was delivered to an office in lower Manhattan overlooking the Hudson and the New Jersey shoreline.

The flowers were part of the tribute paid by Raymond Concrete Pile Co. to a man who was completing his 50th year as an officer and top executive of the firm. The man is Maxwell M. Upson, chairman of the board, who, at 81, is still going strong.

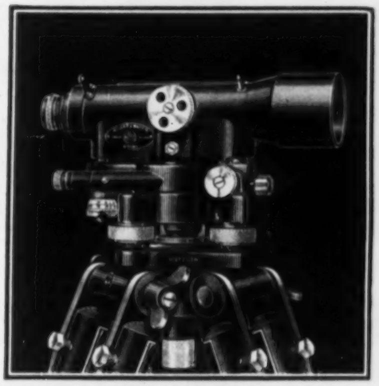
He is still intensely active in the fields of business, engineering, finance, education and religion, even though he admits to taking things a little easier in recent years. He even finds time occasionally to patent an idea or two—and patents are a strong point with him. More than 50 patents on a variety of things now stand to his credit. In fact, it was the sale of a patent that enabled him to start his steady climb with the Raymond company.

**• Midwest background**—Maxwell Mayhew Upson was born in Milwaukee, on Apr. 22, 1876. When he was 5, his parents moved to a large wheat farm in North Dakota, and until he was 13, his education was in the custody of a young minister who lived in the family home. After one year of high school at Grand Forks, he entered the preparatory department of the University of North Dakota, then took the collegiate course.

During that period he augmented his income by selling bicycles. So successful were his business enterprises that when he received his BA degree in 1896, he had a bank account in excess of $700. With this money he began an engineering course at Cornell.

The summer of 1899 found Mr. Upson with a mechanical engineering degree and a debt of $1,200. In spite of his financial position he declined an offer of a position in a Connecticut textile mill owned by a wealthy uncle. In all seriousness he now says, "I have often thought of what a tragedy it would have been had my father been able to provide me with all the money I needed while I was going through school. One of the best lessons a young man must learn early in life is that he must make his own decisions and stand on his own two feet."

(*Continued on page 82*)



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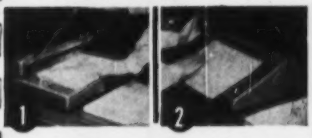

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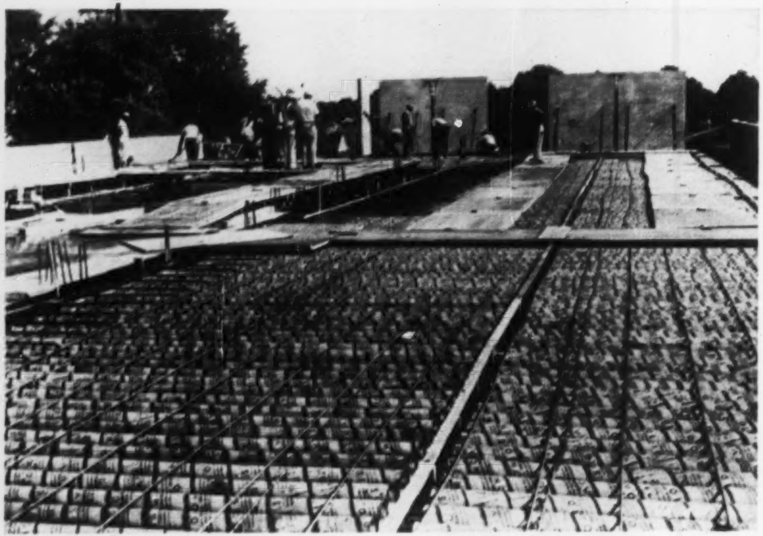
**Hollow concrete slabs for floors and roofs *reduce weight!***



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Form the hollows by displacing concrete at the neutral axis with Sonoco SONOVOID Fibre Tubes . . . reduce weight, save concrete, reinforcing steel!

These easy-to-handle, low-cost fibre tubes were specifically developed for use in bridge decks, floor, roof and lift slabs and in concrete piles. For prestressed, precast units or units cast in place.

Order Sonoco SONOVOID Fibre Tubes in sizes from 2.25" to 36.9" O.D. up to 48' long. Specify lengths to meet your needs or saw to your requirements on the job. End closures available.

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Instead of joining the textile firm Mr. Upson took a job at $50 a month with the Westinghouse, Church, Kerr Co., an engineering and construction firm specializing in the design and building of power and industrial plants. In 1903, after four years as a field superintendent, he was made a construction manager with headquarters in New York—a promotion that may well have hastened the advent of reinforced concrete as a construction material.

• **Do it yourself**—At that time, reinforced concrete was regarded by engineers with skepticism, principally because little was known of its characteristics. There were then in the U. S. only a few reinforced concrete buildings, most of them erected in California by E. L. Ransome. But Mr. Upson, evidencing what he calls his "ability to see around corners," designed and built nine reinforced concrete buildings for the Canadian Westinghouse Co. in Hamilton, Ontario.

In designing the plants, Mr. Upson comments that he had to devise his own formulas and tests, since he could find no precedent on which to base his calculations.

Although the Hamilton plant created a stir in construction industry, it was the concensus of most engineers that reinforced concrete as a material for sustaining vibrating loads would be entirely unsatisfactory, since the vibration would shake the concrete loose from the steel. To disprove this theory, Mr. Upson took a leave-of-absence from his employer and assumed the position he had turned down several years before—that of chief engineer and assistant to the president of his uncle's textile plant, Hockanum Mills in Rockville, Conn. In this capacity he designed and assisted in the construction of what he believes to have been the first all-reinforced concrete textile mill.

Up to this time high quality textile weaving was done on the ground floor of textile mills because excess vibration in upper stories caused imperfections. In Mr. Upson's structure vibration of the upper floors was virtually eliminated, but the mill nevertheless was kept under observation for several years before reinforced concrete finally was regarded as suitable for this purpose.

• **Invention paves way**—With the Hockanum building completed, Mr. Upson returned to his original job and was sent to construct a chemical plant in Detroit. Here he became interested in a project that was to play an important role in his life.

He recognized the need for an automatic gas producer to provide the fuel for the gas engines used in the production of the direct-current electricity then used. On his own time he designed, fabricated and installed a plant to meet this need. So successful was the gas producer that Herman Westinghouse asked him to sell his patent rights.

According to Mr. Upson the longest two minutes of his life followed the question—"How much do you want for the patent?" He didn't know whether to ask for $5,000, $50,000 or $100,000. He now admits that he would have been willing to give it way for enough money to pay the debts accumulated in the development of the machine. However, he gambled and said, "I'll take $22,000." "When the prospective purchaser quickly said 'Fine', I knew I had made a mistake," says Mr. Upson.

The sale of the patent netted Mr. Upson $17,000. Now he was free to follow a long-held belief: The only way to make money is to find a good product, develop it to its greatest efficiency, protect it with patents and sell it for a reasonable price.

• **Into Raymond**—It was natural that he should look to a concrete product, and his search led him to the Raymond Concrete Pile Co.

Today, Raymond is a multi-million dollar concern, with 40 subsidiaries and more than 20,000 people on its payrolls. It has 38 offices scattered around the world, and it can point to some 36,000 completed contracts of which 1,300 were in foreign lands.

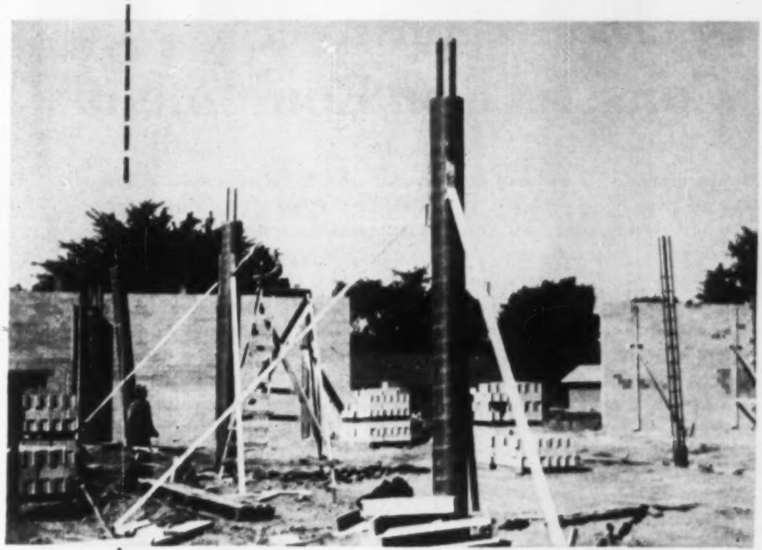
This is a far cry from the Raymond that Mr. Upson bought into in 1907. The organization then had two offices—one in Chicago and the other in New York—and between the two there were six permanent employees. The company had only 50 relatively small jobs to its credit, and it was fighting for recognition of its product. It was also heavily in debt to its president, Morton D. Hull, who, between 1904 and 1912, loaned the firm more than $500,000.

In spite of this picture, and against the advice of many of his friends, Mr. Upson bought a substantial interest in Raymond, and on Oct. 7, 1907, he became its general manager, chief engineer, secretary and a director.

In the 50 years that have passed since, the company has become a colossus in its field—and a great deal of its growth is directly attributable to its boss.

His ideas of specialization are still a matter of company policy. The study and research methods used by him in developing the products and equipment on which he holds patents are now carried on by the company at a cost of

**Money-saving forms for *round* concrete columns!**



Westgate Shopping Center, Toledo, Ohio
Bernard Greenbaum, owner, designer and builder.

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TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances, up to 150 feet or more.

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They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls increases ease of operation and means the virtual elimination of maintenance.

**Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below**

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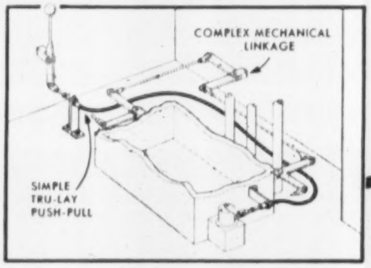
Compare the TRU-LAY PUSH-PULL cable in illustration with the mechanical linkage. PUSH-PULLS are simple, have but one moving part, are noiseless and give lifetime service accuracy. Linkages are complex, made of many parts; they wear at many points. Their use brings increased backlash, lost accuracy and vibration rattles.



**"Solid as a rod but flexible as a wire rope"** is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

*Our **DATA FILE** will answer your further questions*
*Write for a copy without obligation*

Push-Pull
DATA FILE

ACCO
AUTOMOTIVE and AIRCRAFT DIVISION
AMERICAN CHAIN & CABLE
601-F Stephenson Bldg., Detroit 2
2216-F South Garfield Ave., Los Angeles 22 • 929-F Connecticut Ave., Bridgeport 2, Conn.
TRADE MARK

more than a half million dollars a year. His contributions to both Raymond and the construction industry in general have been numerous, and they have not gone unnoticed. In 1931 the University of North Dakota conferred on him the degree of Doctor of Engineering. In 1940 Franklin Institute awarded him the Edward Longstreth Medal with the citation: "In consideration of his contribution to the scientific development of foundation engineering and construction, characterized by genius for invention and technical skill."

In addition to being a pioneer in the use of reinforced concrete, Mr. Upson also pioneered the use of prestressed concrete. His hollow-core prestressed piles are today an important source of revenue for the company.

His effects on the Raymond company go beyond the field of technical advancement. In 1917 he became vice president; in 1930 president; and in 1946 chairman of the board. He was succeeded in the presidency by William V. McMenimen. (At present the executive control is headed by George F. Ferris, as president, and Myron W. Krueger, as executive vice president and treasurer.)

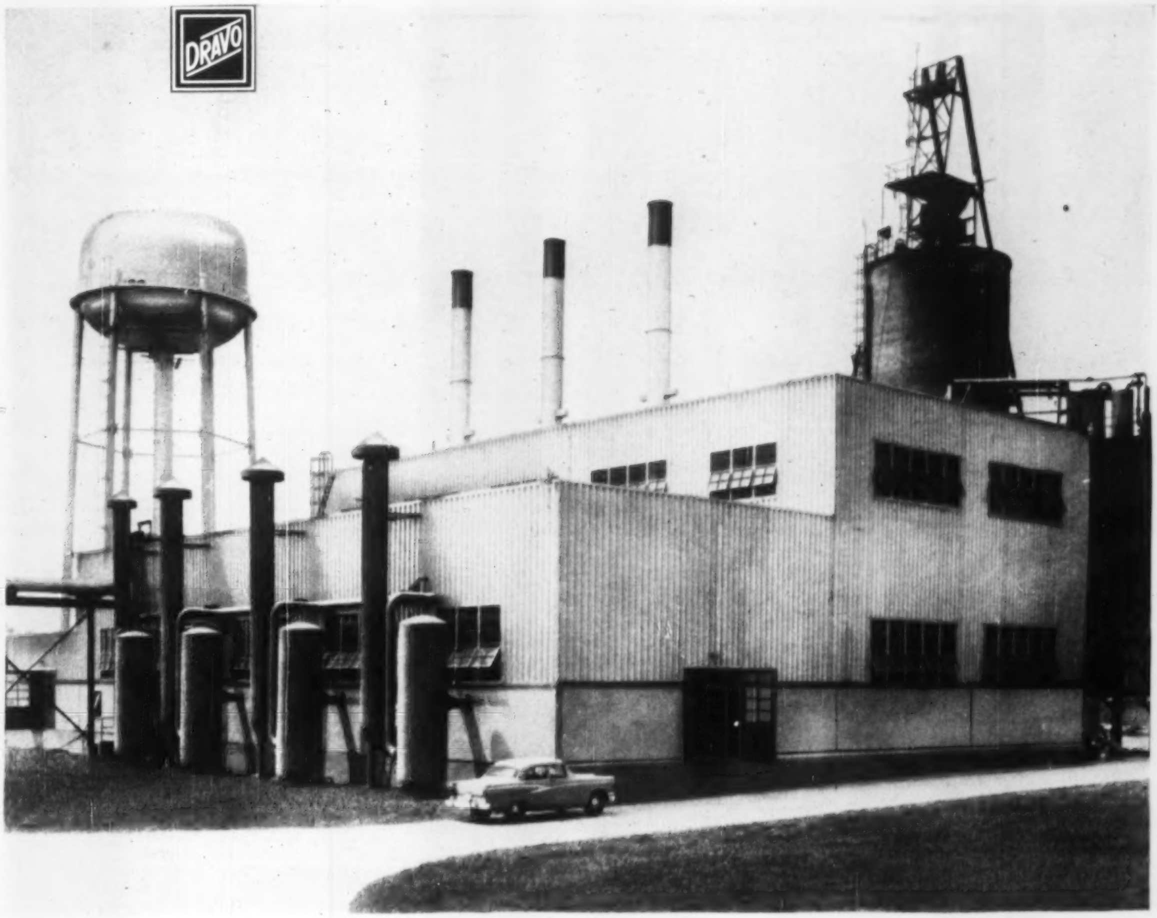
Throughout this time, Mr. Upson has influenced company policy greatly—and "influenced" is the proper word, for he claims that almost never has he issued an order. His favorite method of promoting an idea or policy has been to get his top men together, make a suggestion or plant the seed of an idea and let his executives take it from there.

Teamwork, to Mr. Upson's thinking, is a prime requisite of a well-run organization.

New blood is another essential. By his own example, the chairman puts no age limit on an executive, but he is opposed to putting any man over 50 into an administrative position. He feels that men should be hired while in their 20's or 30's; every man over 50 should have an understudy who can take over his responsibilities. "Many men are as good at 60 as the average is at 50, but it should ever be kept in mind that physical vigor and endurance are important factors in producing and administrating."

Largely because of this age policy, the company takes on about 15 "cadets" — as Mr. Upson calls them — to be trained for supervisory and, later, executive positions. By careful selection, a large percentage of these men work out to be valuable to the firm. In this way Raymond maintains an active staff.

That Mr. Upson himself has not lost his spark is evidenced by his activities both within and outside of Raymond



## Five "turn-key" boiler plants for FORD

Five new Ford Motor Company factories will have Dravo-built steam generating and air compressor plants similar to this one in Sterling Township near Detroit. Three are in operation, the fourth and fifth are under way. First of these turnkey projects was built in 1955. Ford engineers specified design requirements . . . Dravo handled engineering-construction, procured equipment and erected the complete plant.

Dravo has built more than 80 power and steam generating plants for both industrial and central station use. The combination of pipe fabrication facilities and construction experience produces low cost plants that are economical to operate and maintain.

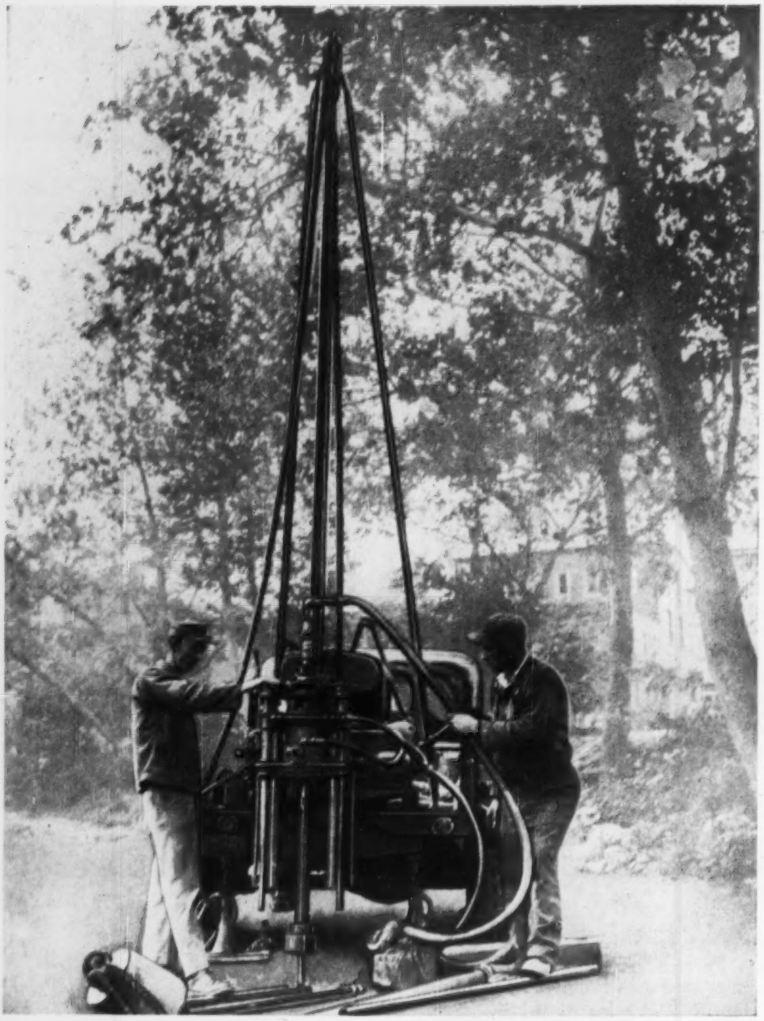
Your next construction project may benefit by making use of this teamwork. For information on this, or any of the products and services listed below, write DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

**DRAVO**
CORPORATION

Blast furnace blowers · boiler & power plants · bridge sub-structures · cab conditioners · docks & unloaders · dredging · fabricated piping

foundations · gantry & floating cranes · gas & oil pumping stations · locks and dams · ore & coal bridges · process equipment · pumphouses & intakes

river sand and gravel · sintering plants · slopes, shafts, tunnels · space heaters · steel grating · towboats, barges, river transportation



SPRAGUE & HENWOOD MAKES THE EQUIPMENT FOR THE SOIL SAMPLE OR ROCK CORE YOU WANT

With the earth-shaking increase in construction, you need efficient, versatile sampling and coring equipment.

Sprague & Henwood, Inc., a leading manufacturer of all types of equipment for foundation investigation, has just the right type for you!

Illustrated above, on location, is a truck-mounted Sprague & Henwood Model 30 Core Drill Machine. On this foundation project this machine is recovering both good samples and good cores. The soil samples have already been recovered from this boring and now the machine is being used to core rock. Because of the versatility and economy of this machine it is becoming a favorite of many contractors and other users throughout America.

The proper machine alone will not give you the good soil samples and rock cores you want. You need just the right samplers, accessory equipment and coring bits. If you need a sampler to determine only the general classification of the sub-surface soils or a sampler to secure samples for testing in a soils laboratory, Sprague & Henwood has it. There is a complete line of accessory equipment and the best in "Oriented" Diamond Bits awaiting you. One call . . . to SPRAGUE & HENWOOD, Inc., and your drilling equipment needs can be met.

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • PITTSBURGH • ATLANTA
GRAND JUNCTION, COLORADO • BUCHANS, NEWFOUNDLAND
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Concrete. He is the senior trustee of Cornell University, a director and member of the executive committee of the Boys' Club of America, honorary president of Pan American Society, honorary trustee of the Committee for Economic Development, a member of the American Society of Mechanical Engineers, American Society of Civil Engineers, American Concrete Institute, American Society for Testing Materials and the National Institute of Social Sciences. He is also serving as an elder in the Presbyterian Church in Englewood, N. J., where he has resided for 50 years.

As for his own success, he attributes it more to ideals than ideas—"My mother was a religious woman," says Mr. Upson, "and she impressed upon me the fact that if a man has faith, has confidence in himself, adheres to the tenets of the Ten Commandments and follows the Golden Rule, he must succeed. For faith and integrity are the foundation of good character without which no man is a success, regardless of how high he climbs."

## Careers

### Business

**James F. Haley** and **Harl P. Aldrich, Jr.**, have formed the partnership of Haley & Aldrich, consulting soils engineers, in Cambridge, Mass.

**John Alexanders** has opened an office for practice as a consulting structural engineer in Cresskill, N. J.

**Max Gleissner** has been appointed chief engineer and assistant manager for Falcon Air Maps Co., Denver.

**Gerald H. Brown** has been elected vice president and construction manager of United Engineers and Constructors, Inc., Philadelphia.

**Walter Kakin** has joined American Cast Iron Pipe Co., Birmingham, Ala., as consultant and sales agent for the special products division.

**Jose Solis** has been appointed development engineer of the U. S. Steel Homes Division, U. S. Steel Corp., Harrisburg, Pa.

**Claude N. Freeman** has retired from the architectural firm of Freeman, Hayslip, Tuft & Hewlett, Portland, Ore. But he will, however, continue as a consultant and special representative for the firm.

**Andrew C. Paton** has joined Metcalf & Eddy, Boston engineering firm, as director of operations.

**H. E. Hudson, Jr.**, has become a partner in Hazen & Sawyer, New York City engineering firm.

**Roy W. Booth** of Chicago has been elected a director of the George A. Fuller Co.

STOODY HARD-FACING ALLOYS

# STOODY 1030

## A new, low-cost hard-facing electrode that excels in *POSITION* WELDING!

Here's a new Stoody hard-facing rod especially made to fulfill several "musts"! *Stoody 1030 is unusual in its all-position weldability!* This means easier, faster hard-facing on much larger equipment...equipment which has to be hard-faced in the yard or on the job...equipment which can't be positioned to facilitate a down-hand welding setup!

**TOP WEAR RESISTANCE within its price class!** Stoody 1030 fits between Stoody Self-Hardening and Stoody 21 in wear qualities, favoring the latter. It satisfies all requirements where good abrasion resistance is essential, at the same time saves several cents per pound.

**EXCELLENT COMPRESSIVE STRENGTH** adapts Stoody 1030 to such applications as roll crushers; also sides, lips and teeth of power shovel buckets; drag lines and clamshells; carrying scraper blades, runners, etc.

**APPLICATION**—Either AC or DC, with a choice of straight or reverse polarity on DC. 3/16" rods weld at 140-220 amps, 5/16" rods at 225-275 amps. Straight polarity induces very fast burn-off and minimum penetration. Deposits set up rapidly, easily holding edges of welds. Spatter is negligible; overall application efficiency is approximately 78%. No slag covering results, makes easy multiple passes. Complete size range from 5/32" to 5/16".

Try Stoody 1030 on your next job – test its position welding advantages and wear resistance...make extra savings with its low cost!

Literature on Stoody 1030 is available from your Stoody Dealer (check the Yellow Pages of your phone book) or write direct.

**STOODY COMPANY**
11976 East Slauson Avenue
Whittier, California

# Unit Prices

## Atomic Energy Cost, New Mexico

U. S. Atomic Energy Commission, Los Alamos, New Mex. contract for $4,503,700 to Robert E. McKee, General Contractor, Inc., Sante Fe, New Mex. (16.1% above government estimate, but about 8% below next bid) for the erection of Sigma Building TA-3 and other buildings, together with grounds and utilities, included the lump sum of $4,179,500 for the 165,000 sq sigma building, an average of $25.33 per sq. ft.

The three bids follow. A fourth totaling $5,502,647 was irregular.

| | | |
|---|---|---|
| 1C | Robert E. McKee, General Contractor, Inc., Santa Fe, New Mex | $4,503,700 |
| 2 | C. H. Leavell & Co., El Paso, Tex | 4,892,966 |
| 3 | George A. Rutherford, Inc., Albuquerque, New Mex | 5,272,000 |
| EE | U. S. Government | 3,880,661 |

| Bids: 4-17-57<br>Items | Unit | Quantity | Unit Prices 1C | 2 |
|---|---|---|---|---|
| Sigma bldg (165,000 sf) complete | ls | job | $4,179,500 | $4,579,826 |
| Guard station, complete | ea | 1 | 10,000 | 9,484 |
| Cooling tower complete | ls | job | 44,011 | 43,080 |
| Clring & grubbing | ac | 15 3 | 134 00 | 290 00 |
| Exc uncl | cy | 10,147 | 0 67 | 0.70 |
| Compacted embankment | cy | 16,093 | 0 56 | 0 20 |
| Exc struct, drainage | cy | 142 | 6 60 | 2.00 |
| CM culv pipe, 15" | lf | 492 | 2 95 | 3 25 |
| CMP end sect, 15" | ea | 13 | 16 42 | 20.00 |
| Bit prime coat | sy | 11,796 | 0.12 | 0.07 |
| Hotmix asph conc 2" th | sy | 11,796 | 1 65 | 1.50 |
| Base crse stab agg | cy | 2,915 | 6 00 | 4 16 |
| Conc sidewalk | sy | 270 | 4 15 | 4 00 |
| curb & gutter | cy | 27 1 | 54 69 | 40 00 |
| Pavement replacement | sy | 10 | 5 50 | 4 00 |
| Guardrail, met | lf | 600 | 3 64 | 3 32 |
| Guard posts | ea | 27 | 8 04 | 10 00 |
| Conc for manproofing | cy | 1 | 29 17 | 75 00 |
| Stl bars for manproofing | lb | 200 | 0 13 | 0 30 |
| Rock for ditch protec | cy | 12 | 23 38 | 15 00 |
| Fence, 9' chain link | lf | 2,174 | 2 90 | 2 68 |
| Gate, 24' double chain link | ea | 1 | 290 00 | 268 00 |
| 4' personnel chain link | ea | 1 | 104 00 | 96 00 |
| Fence, 8'-10' woven-wire const | lf | 135 | 1 92 | 1 77 |
| Trench exc, | | | | |
| 0'-4' deep | lf | 4,087 | 0 82 | 0 60 |
| 4'-6' deep | lf | 1,009 | 1 27 | 0 90 |
| 6'-8' deep | lf | 213 | 2 18 | 1 50 |
| 8'-10' deep | lf | 216 | 2 60 | 2 25 |
| 10'-12' deep | lf | 144 | 2 91 | 3 00 |
| 12'-14' deep | lf | 189 | 3 12 | 3 75 |
| 14'-16' deep | lf | 214 | 3 30 | 4 50 |
| 16'-20' deep | lf | 162 | 14 25 | 6 00 |
| 20'-24' deep | lf | 336 | 20 60 | 6 75 |
| 24'-28' deep | lf | 82 | 30 88 | 10 00 |
| CI water line mech jt, 10" | lf | 183 | 6 26 | 5 90 |
| 8" | lf | 265 | 4 56 | 4 60 |
| 6" | lf | 1,175 | 3 58 | 3 15 |
| 4" | lf | 80 | 2 80 | 2 70 |
| CI mech jt, 3" | lf | 23 | 4 03 | 2 30 |
| CI mech jt ftgs (water) | lb | 1,755 | 0 37 | 0 40 |
| CI gate vlv & box (water) 8" | ea | 1 | 181 00 | 135 00 |
| 6" | ea | 3 | 110 00 | 90 00 |
| 4" | ea | 2 | 93 50 | 78 00 |
| 3" | ea | 1 | 90 55 | 64 00 |
| 2½" | ea | 1 | 88 18 | 58 00 |
| CI galv water serv line 2½" | lf | 110 | 2 31 | 1 70 |
| Galv water serv line, 1" | lf | 60 | 1 69 | 0 65 |
| Conc encasement | job | 1 | 83 46 | 30.00 |
| Indicator vlv & box, 6" | ea | 3 | 278 18 | 240 00 |
| Fire hyd assemb incl 6" gate vlv & vlv box | ea | 2 | 341 95 | 400 00 |
| Stl gas line, 2" | lf | 1,237 | 1 22 | 1 35 |
| Pressure reduc sta, Gas No. 1 | ea | 1 | 490 80 | 310 00 |
| 2 | ea | 1 | 490 80 | 310 00 |
| 3 | ea | 1 | 270 00 | 195 00 |
| VC pipe, 10" | lf | 565 | 2 18 | 2 90 |
| 8" | lf | 112 | 2 09 | 2 25 |
| 6" | lf | 1,325 | 1 67 | 1 85 |
| 10", extr strength | lf | 110 | 2 73 | 4 00 |
| 6", extr strength | lf | 600 | 1 46 | 2 60 |
| Manholes, sewer, S-1 | ea | 1 | $1,514 | $1,100 |
| S-2 | ea | 1 | 1,636 | 1,100 |
| S-3 | ea | 1 | 1,494 | 1,100 |
| acid sewer, A-1 | ea | 1 | 992 00 | 1,000 |
| A-2 | ea | 1 | 894 00 | 1,000 |
| A-3 | ea | 1 | 778 00 | 1,000 |
| Pipe 6" & 3" in cond steam & condensate | lf | 66 | 24 48 | 27 00 |
| Connect to stub from manhole | ea | 2 | 31 00 | 525 00 |
| Switchgear outdoor met clad 15 KV cl | ls | job | 124,300 | 131,800 |
| New fence ltg std., base single fixt | ea | 16 | 412 00 | 417 00 |
| double fixt | ea | 4 | 533 00 | 574 00 |
| Reloc exist fence ltg fixt, new base | ea | 3 | 99 00 | 244 00 |
| Conc pull box 2'x3'x2' underground | ea | 4 | 482 64 | 280 00 |
| Fire alarm, master ped & base | ea | 1 | 554 00 | 548 57 |
| Fence & gate grounding | ea | 12 | 50 75 | 34 80 |
| Duct bank, 12-4" fiber ducts, spacers & encasement | lf | 125 | 14 58 | 10 40 |
| Rig galv stl cond with pull-wire, 3" | lf | 140 | 2 93 | 2 29 |
| 1" | lf | 160 | 0 83 | 0 75 |
| Rig galv stl cond, 2½" | lf | 410 | 2 28 | 1 91 |
| 1½" | lf | 100 | 1 58 | 0 78 |
| 1¼" | lf | 375 | 1 08 | 0 78 |
| 1" | lf | 815 | 0 72 | 0 65 |
| Transite conduit 2" | lf | 180 | 0 74 | 0 64 |
| Cable, copper, #1/0 15 KV undergr neutral shielded rub insul single conduc | lf | 3,375 | 2 40 | 2 35 |
| #6 RR 5 KV single conduc | lf | 3,250 | 0.19 | 1.95 |
| Conduc, copper #1/0 bare, stranded | lf | 3,400 | 0 32 | 0.25 |
| single, 600V | | | | |
| #2/0 RH-RW | lf | 750 | 0 57 | 0 68 |
| # 4 TW | lf | 250 | 0 22 | 0 28 |
| # 8 TW | lf | 1,820 | 0 11 | 0 12 |
| #10 TW | lf | 1,340 | 0 10 | 0 07 |
| #10 RR, direct burial | lf | 470 | 0 61 | 0 63 |
| 12 TW | lf | 2,700 | 0 08 | 0 04 |
| 14 TW | lf | 11,200 | 0 07 | 0 05 |

## Steel Bulkhead, Florida

R. H. H. Blackwell & Sons, Jacksonville, Fla., placed the successful bid to construct a $73,202 sheet pile bulkhead with tie back and fender systems, and a single treatment bituminous pavement on a 6-in. lime rock base, at the U. S. Coast Guard Station, Fort Pierce, Fla. to provide moorings for boats and vessels. Greenheart material for the fender system took the job away from the creosoted pine alternate.

Wages prevailing on this job include: structural workers $3.00, carpenters $2.625, tractor operators $1.50, shovel and crane operators $2.50, common and unskilled labor $1.00.

| | | |
|---|---|---|
| 1C | R. H. H. Blackwell, Jacksonville, Fla | $73,202 |
| 2 | O'Loughlin & Hanson, Inc., Jacksonville, Fla | 69,051a |

| Bids: 9-4-57<br>Items | Unit | Quantity | Unit Prices 1C | 2 |
|---|---|---|---|---|
| Remove & redrive exist stl piling; install add stl sht piling, stl channel cap, tie rods, tie back walls, hardware, exc and fill, and all necessary incidentals | lf | 311 | $191 71 | $171 95 |
| Bituminous pavement | sy | 6030b | 2 10 | 2 85 |
| Fender system, Greenheart mat | lf | 280 | 22 25 | nb |
| Alt. creosoted pine | lf | 280 | 15 50 | 20 00 |

Complete 240 days. Liq dam $50/day

a Fender system using creosoted material
b Contract awarded on 3,500 sy

Rx for Wet Job "Headaches"
Consult with Griffin's engineers.
Ground water analysis and pre-bid estimate—no obligation.

GRIFFIN WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

ELGOOD HYDRAULIC & MECHANICAL JACKS to 600 ton capacity

RENTALS - SALES

PIPE PUSHING - ERECTION - PILE DRIVING
PILE TESTING - PRESTRESSED CONCRETE
SPECIAL APPLICATIONS

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373 TEN EYCK ST., BROOKLYN, N. Y., HY 7-5445

McKIERNAN-TERRY
WIDE-RANGE LINE OF PILE HAMMERS AND EXTRACTORS

Now made in complete standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Also Sand Drain Equipment and Steam Generators.

Write for free descriptive Bulletins.

Also builders of coal and ore bridges and unloaders, and specially designed machinery.

McKIERNAN-TERRY CORP.
32 Mercer Street, Dover, N. J.

# Nationwide service on Bitumuls & Asphalt for every paving need...all from one source!

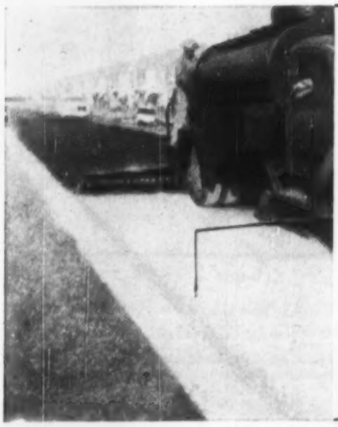
**PENNSYLVANIA:** Laykold® Asphaltic Concrete solves a tough paving problem on the Liberty Bridge, a major approach to downtown Pittsburgh. (When it comes to pavements, bridges are notoriously "bad actors" because expansion and contraction of the deck result in an unusual degree of movement under the surfacing). Based on previous use of Laykold Asphaltic Concrete, Department of Public Work officials for Allegheny County knew that this material retained an extra measure of resilience after placement and compaction, with no decrease in load-bearing value.

Mixed with slag aggregate, a 120 lb. "LAC" binder course and a 100 lb. "LAC" surface course were placed over an area of some 32,000 sq. yds. Trumbull Construction & Asphalt Company of Pittsburgh did the work. American Bitumuls & Asphalt Company supplied the asphalt and the Laykold Tempering Fluid.

*Results to date: excellent service; no pavement failures.*

LIBERTY TUNNELS

**CALIFORNIA:** Across the nation, on the Pacific Coast, the State of California Department of Highways let a half-million-dollar contract for re-surfacing 41 miles of U. S. Highway 99 to the Schroeder Company, of Sun Valley, California. For this job, American Bitumuls & Asphalt Company supplied: 1,700 tons of Air Refined Asphalt; 3,500 tons of Paving Asphalt; 140,000 gallons of Bitumuls® Emulsified Asphalt.



**LOUISIANA:** While "down South," on the construction of a road for private industry at Grand Isle, La., American Bitumuls & Asphalt Company supplied Bitumuls Emulsified Asphalt for 20,000 sq. yds. of 3-course surface treatment work on which *clam shells* were used as aggregate. As cover aggregate, shell produces a long-wearing surface.

Whenever . . . and wherever . . . your paving job calls for asphalt or asphaltic products, call our office nearest you. *That's your single source for all your asphalt requirements.*

**American Bitumuls & Asphalt Company**

**200 Bush St., San Francisco 20, Calif.** Perth Amboy, N. J.
Baltimore 3, Md. St. Louis 17, Mo. Cincinnati 38, Ohio
Mobile, Ala. San Juan 23, P. R. Tucson, Ariz.
Inglewood, Calif. Oakland 1, Calif. Portland 7, Ore.

# Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

**See following ENR issues for OTHER PRICES:**

- Clay Products, Lime, Plaster, Paint, Roofing: Last, Sept. 26; Next Oct. 31.
- Wage Rates, Building Board, Lath, Insulation: Last, Oct. 3; Next Oct. 31.
- Cement Aggregates, Ready-mixed Concrete Asphalt: Last, Oct. 10; Next Nov. 7.
- Iron & Steel Products, Pine: Last, Oct. 17; Next Nov. 14.

## LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

**All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)**

*All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)*

| | | 1x6 s4s | 1x8 s4s | 2x4 s4s | 2x6 s4s | 2x8 s4s | 2x10 s4s | 3x12 Rgh | 6x12 Rgh | 12x12 Rgh | LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh | LONG LEAF Y. P. 12x12 Rgh | PLYWOOD Rail freight increment (See note for base price) 5/8" | PLYWOOD 3/4" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atlanta | † | $73.00 | $78.00 | $76.00 | $79.00 | $81.00 | $86.00 | $136.00 | ...... | ...... | $121.00 | $156.00 | $22.32 | $27.24 |
| Baltimore | * | 95.00 | 100.00 | 100.00 | 100.00 | 100.00 | 105.00 | 114.00 | ...... | ...... | 170.00 | 185.00 | 25.92 | 31.60 |
| | | *100.00g* | *105.00g* | *123.00g* | *123.00g* | *123.00g* | *123.00g* | *133.00g* | *$150.00* | *$144.00* | ...... | ...... | ...... | ...... |
| Birmingham | † | 87.00 | 89.00 | 82.00 | 89.00 | 92.00 | 97.00 | 112.00 | ...... | ...... | 115.00 | 160.00 | 21.78 | 26.58 |
| | | *108.50* | *108.50* | *105.00* | *108.00* | *108.00* | *113.00* | *111.50* | *108.50* | *108.50* | ...... | ...... | ...... | ...... |
| Boston | 1 | 97.00f | 92.00f | 98.00f | 98.00f | 98.00f | 105.00a | ...... | ...... | ...... | ...... | ...... | 25.92 | 31.60 |
| | | *92.00k* | *92.00k* | *108.00* | *108.00* | *108.00* | *110.00* | *114.00* | *119.00* | *123.00* | ...... | ...... | ...... | ...... |
| Chicago | ** | 92.00 | 97.00 | 91.00 | 105.00 | 113.00 | 114.00 | 109.00 | ...... | ...... | 137.00 | 137.00 | 22.45 | 27.37 |
| | | *102.00* | *102.00* | *115.00* | *113.00* | *113.00* | *114.00* | *122.00* | *122.00* | *122.00* | ...... | ...... | ...... | ...... |
| Cincinnati | * | 93.00 | 94.25 | 84.50 | 90.50 | 95.00 | 102.75 | 116.00 | ...... | ...... | 139.25 | 137.50 | 25.00 | 30.48 |
| | | *97.00* | *98.00* | *102.75* | *104.75* | *105.75* | *109.00* | *130.00* | *130.00* | *130.00* | ...... | ...... | ...... | ...... |
| Cleveland | ** | 90.00 | 91.00 | 97.00 | 97.00 | 97.00 | 97.00 | ...... | ...... | ...... | ...... | ...... | 25.37 | 30.93 |
| | | ...... | ...... | *110.00* | *101.00* | *101.00* | *101.00* | *136.00* | *136.00* | *136.00* | ...... | ...... | ...... | ...... |
| Dallas | k‡ | 70.00 | 70.00 | 65.00 | 65.00 | 65.00 | 70.00 | 140.00 | ...... | ...... | 136.00 | 130.00 | 18.72 | 22.80 |
| Denver | * | *Not in stock* | | *122.50* | *122.50* | *122.50* | *127.00* | *141.50* | *148.50* | *152.25* | ...... | ...... | 13.92 | 16.98 |
| Detroit | ‡ | 116.50 | 119.50 | 114.00 | 117.00 | 122.00 | 122.00 | ...... | ...... | ...... | 130.00 | ...... | 25.00 | 30.48 |
| | | *125.00* | *125.00* | *130.00* | *132.50* | *130.00* | *135.00* | *185.00* | *195.00* | *195.00* | ...... | ...... | ...... | ...... |
| Kansas City | 1 | 120.00 | 120.00 | 120.00 | 120.00 | 125.00 | 135.00 | ...... | ...... | ...... | ...... | ...... | 16.56 | 20.16 |
| | | *120.00* | *120.00* | *120.00* | *120.00* | *125.00* | *130.00* | *150.00* | *225.00* | *225.00* | ...... | ...... | ...... | ...... |
| Los Angeles | 3 | *95.00* | *95.00* | *95.00* | *95.00* | *95.00* | *95.00* | *119.00* | *130.00* | *130.00* | ...... | ...... | 16.61ab | 20.25ab |
| Minneapolis | # | *135.00m* | *135.00m* | *140.00* | *140.00* | *140.00* | *140.00* | *185.00* | *185.00* | *185.00* | ...... | ...... | 19.80 | 24.25 |
| Montreal | ab | 92.00 | 100.00 | 92.00 | 93.00 | 110.00 | 128.00 | ...... | ...... | l ...... | 125.00 | 125.00 | ...... | ...... |
| | | *178.00* | *178.00* | *178.00* | *178.00* | *178.00* | *178.00* | *171.00* | *171.00* | *171.00* | ...... | ...... | ...... | ...... |
| New Orleans | † | 87.00 | 87.00 | 94.00 | 91.00 | 90.00 | 97.00 | 121.50 | ...... | ...... | 151.00 | 151.00 | 18.72 | 22.80 |
| | † | *110.00* | *110.00* | *104.50* | *120.00* | *120.00* | *120.00* | *132.50* | *132.50* | *152.50* | ...... | ...... | ...... | ...... |
| New York | 1 | 107.00 | 108.00 | 114.00 | 116.00 | 116.00 | 120.00 | ...... | ...... | ...... | 240.00 | 255.00 | 25.92 | 31.60 |
| | | ...... | ...... | *116.00* | *118.00* | *119.00* | *120.00* | *164.00* | *164.00* | *164.00* | ...... | ...... | ...... | ...... |
| Philadelphia | ‡ | | Range from 109/129 | | | | 112/132 | 133/155 | ...... | ...... | 214/224 | 214/224 | 28.00 | 32.00 |
| | | | *Range from 120/150* | | | | *131/163* | *136/158* | *165.00* | *165.00* | ...... | ...... | ...... | ...... |
| Pittsburgh | 2 | 120.00 | 120.00 | 125.00 | 120.00 | 125.00 | 130.00 | 145.00 | ...... | ...... | 148.00 | 185.00 | 25.92 | 31.60 |
| | | *130.00* | *130.00* | *140.00* | *140.00* | *140.00* | *140.00* | *185.00* | *185.00* | *185.00* | ...... | ...... | ...... | ...... |
| St. Louis | # | 118.00 | 120.00 | 128.00d | 128.00d | 128.00e | 133.00e | ...... | ...... | ...... | ...... | ...... | 18.72 | 22.80 |
| | | ...... | ...... | *137.00* | *137.00e* | *137.00e* | *141.00e* | *195.00e* | *195.00* | *195.00* | ...... | ...... | ...... | ...... |
| San Francisco | † | *76.00* | *76.00* | *82.00* | *82.00* | *82.00* | *82.00* | *105.00* | *116.00* | *116.00* | ...... | ...... | 12.22 | 14.91a |
| Seattle | † | *67.00* | *72.00* | *72.00* | *73.00* | *73.00* | *74.00* | *85.00* | *90.00* | *90.00* | ...... | ...... | ...... | ...... |
| Toronto | a | 91.50 | 95.50 | 90.50 | 91.50 | 91.50 | 91.50 | ...... | ...... | ...... | 93.50 | ...... | ...... | ...... |
| | | *115.00* | *115.00* | *121.00* | *123.00* | *127.00* | *131.00* | *146.00* | *141.00* | *131.00* | ...... | ...... | ...... | ...... |

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. sad., truckload lots, 5/8 Mftbm

**LUMBER:** Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 5M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *f Hemlock *g No. 1 common. *j 8 ft. lengths. *k No. 3 common. *l incl rail rate from Northwest mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures. *m Up to 16"

**PLYWOOD** (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistant, 5/8", $146.00; 3/4", $166.00. Exterior, waterproof, 5/8" $150.00; 3/4", $170.00. For other centers add rail freight increment from table on proper size. *a Lower rate by water shipment. *b 50,000 lbs. minimum.

## GLASS, EXPLOSIVES, CHEMICALS

| | WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950a Single or Double Strength A quality | WINDOW GLASS B quality | EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots* |
|---|---|---|---|
| Atlanta | 78%c | 78%e | $0.2615 |
| Baltimore | 74%d | 76%d | .2615 |
| Birmingham | 82% | 83% | .2065 |
| Boston | 72-10% | 72-10% | .2615 |
| Chicago | 72% | 72% | .2615 |
| Cincinnati | 74% | 74% | .2615 |
| Cleveland | 74-2-10% | 74-2-10% | .3015 |
| Dallas | 76% | 76% | .2690 |
| Denver | 74% | 74% | .2665 |
| Detroit | 74-10-10% | 74-10-10% | .2615 |
| Kansas City | 76-10-10% | 76-10-10% | .2665 |
| Los Angeles | 70% | 76%e | 2640 |
| Minneapolis | 71-10% | 71-10% | 2665 |
| Montreal | 40-10-5%bc | 40-10-5%b | 22.05h |
| New Orleans | 75% | 76% | 2665 |
| New York | 79-10% | 79-10% | 45g |
| Philadelphia | 74-10% | 76-10% | 2615 |
| Pittsburgh | 72% | 72% | 2615 |
| St. Louis | 72-10-10% | 72-10-10% | 2665 |
| San Francisco | 60%-25% | 68%-25% | 2615 |
| Seattle | 67% | 72% | 2640 |

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

**Glass:** *a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality $52.75 for B quality. *b sales tax extra. *c 77% for single strength *d Discount 6/15/52. *e 77% for double strength

**Explosives:** * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40% Forcite 60%, $23.80

**40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)**

| | C/L 20,000 lb. net | Tons | 200 lb. lots |
|---|---|---|---|
| E. of the Miss., except Fla. and Me. | $0.2065 | $0.2465 | $0.2615 |
| W. of Miss. to Rocky Mtn. States, Fla. and Maine | .2115 | .2515 | .2665 |
| Rocky Mtn. States | .2115 | .2515 | .2665 |
| Pacific N. W. States | .2090 | .2490 | .2640 |
| Pacific S. W. States | .2065 | .2465 | .2615 |

## PILES, TIES F.O.B.

### PILES

**Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.**

| Dimensions | Points | Length | By Rail Pine* | By Rail Fir |
|---|---|---|---|---|
| 12-in. at butt | 6-in. | 30 to 50-ft. | $0.51 | .... |
| 12-in.—2-ft. from butt | 6-in. | 50 to 59-ft. | .54 | .... |
| 12-in.—2-ft. from butt | 6-in. | 60 to 69-ft. | .58 | .... |
| 12-in.—2-ft. from butt | 6-in. | 90 to 100-ft. | .... | .... |
| 13-in.—3-ft. from butt | 5-in. | 91 to 100-ft. | .... | .... |
| 14-in.—2-ft. from butt | 6-in. | 50 to 69-ft. | .60/.68 | .... |
| 14-in.—2-ft. from butt | 6-in. | 70 to 79-ft. | .78/.88 | .93 |
| 14-in.—2-ft. from butt | 5-in. | 80 to 85-ft. | .83/.93 | .94 |
| 14-in.—2-ft. from butt | 5-in. | 85 to 89-ft. | .... | 1.00 |
| 14-in.—2-ft. from butt | 5-in. | 90 to 100-ft. | .... | 1.03 |

* Pine piling over 80-ft. available only in limited quantities

### RAILWAY TIES

**Prices f.o.b. per tie for carload lots:**

| | | 6" x 8" x 8' Untr. | 6" x 8" x 8' Tr. | 7" x 8" x 8'6" Untr. | 7" x 8" x 8'6" Tr. |
|---|---|---|---|---|---|
| Birmingham* | Hardwood, Grade 3 | $1.70 | $2.55 | Gr. 5 $2.25 | $3.33 |
| | Grade 2 | 1.50 | 2.35 | " 4 2.10 | 3.18 |
| | Grade 1 | 1.15 | 2.00 | " 3a 1.70 | 2.78 |
| Chicago | Red Oak | ..... | 4.00a | ..... | 4.60a |
| New York | S. L. Sap Pine | 2.00 | 4.00 | 3.00 | 6.00g |
| | Mixed Oak | 2.50 | 4.50 | 3.50 | 6.50g |
| Philadelphia | Red Oak | 2.95/3.15 | 4.50/4.70 | 3.60/3.80 | 5.50/5.75 |
| St. Louis | White Oak | 2.65 | 3.40a | 2.90h | 3.75a |
| San Francisco | Douglas Fir | 2.03ef | 2.96ef | 2.84bef | 4.31ca |

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *c* Empty cell. *e* Green. *f* f.o.b. cars. * Add 75¢/tie freight charge to Birmingham. *h 7" x 9" x 9½"

### CHEMICALS

**Water, sewage treatment, road work, f.o.b. carlots, New York**

| | |
|---|---|
| Bleaching powder in drums f.o.b. works, per 100 lb | $5.02 |
| Chlorine cylinders, liquid, per lb. f.o.b. works | .103 |
| Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton | 29.00 |
| Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb | 2.30 |
| Soda ash, 58%, in paper bags, per 100 lb. dense | 1.70 |
| Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works | 1.85 |
| Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works | 14.90 |

# Why should you pay

## for top quality in "Commercial Grade" Roller Bearings . . . AND NOT GET IT?

It's *wasteful* to pay for quality you don't need. It's *negligent* to pay for quality you don't get.

From the simplest steel-cage type to the finest segmented-retainer type, Rollway "commercial grade" Tru-Rol Roller Bearings incorporate as closely as possible design and construction principles found normally in a Rollway maximum-type precision bearing.

Take the segmented-type Tru-Rol for example. Each deep-section separator segment is formed to fit the curvature of the roller. Each roller has a separator segment to keep it in accurate alignment. And each roller is crowned to distribute load evenly along the full length of the roller.

That's a lot different from small-diameter, unground spacers staggered at unequal intervals, resulting in rollers rubbing in opposed-motion, and non-uniform roller distribution that can set up out-of-balance vibration and "pulse".

Let a near-by Rollway Service Engineer consult with you on your bearing problems. No charge. No obligation. Just write us. Rollway Bearing Co., Inc., Syracuse, N. Y., *manufacturers of a complete line of radial and thrust cylindrical roller bearings.*

Cutaway view of Rollway Tru-Rol® segmented-retainer roller bearing one of three distinct types of Tru-Rol bearings available.

ENGINEERING OFFICES: SYRACUSE • BOSTON • CHICAGO • DETROIT • TORONTO • PITTSBURGH • CLEVELAND • MILWAUKEE • SEATTLE • HOUSTON • PHILADELPHIA • LOS ANGELES • SAN FRANCISCO

### *Check This List* AND BE SURE!

**Retainer Operation**

☐ Is the retainer roller-supported, to reduce sliding friction?

**Retainer Construction**

☐ Is the retainer strong enough to withstand shock loads and sudden reversals?

*(A Rollway segmented-type steel retainer, such as that illustrated, is the strongest, most durable available in commercial grade bearings.)*

**Roller Spacing**

☐ Are all rollers equally separated, or do some rub against each other in opposed-motion friction?

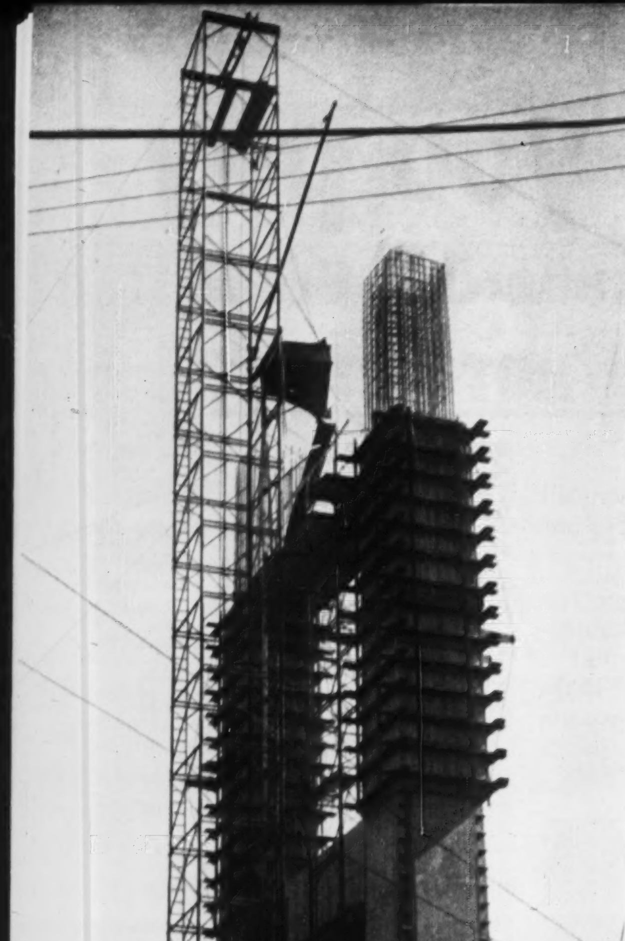
☐ Are rollers distributed evenly to prevent "pulse" and vibration?

**Roller Construction**

☐ Are the rollers crowned for optimum load distribution?

**For Top Quality in Every Detail Buy Tru-Rol and Be Sure!**

ROLLWAY®
Tru-Rol
ROLLER BEARINGS



# CONCRETE GOES UP 130-FOOT TOWER TO SPEED PIER PROJECT

To perform what is regarded as one of the cleanest, fastest bridge jobs of its type, Morrison-Knudsen, has employed a unique concrete handling method on piers ranging up to 107 feet high!

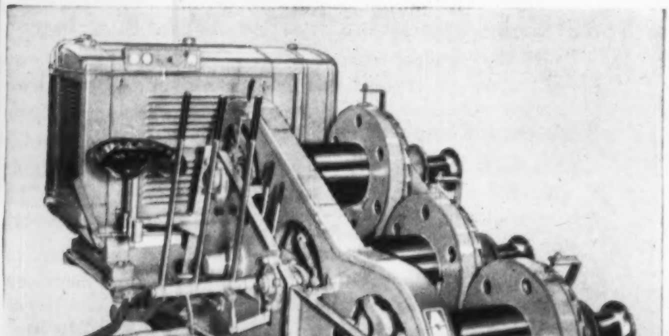
By using a 130-ft tower and a 1-yard rollover bucket, concrete is delivered quickly to the working level. Struts, with forms supported by heavy duty tubular steel scaffolding are poured as an integral part of the pier.

Two American 2-drum General Purpose Hoists are used by the contractor. This 13-pier project will span the Spokane River at Spokane, Washington.

Because there's a rugged, reliable American Hoist to fit every lifting job, they're first choice of leading contractors from coast to coast. Versatile American General Purpose Hoists provide 3,000 to 12,000 pound single line pull capacities. American Iron Workers' Special Hoists—a complete line of specially designed hoists that meet the strict requirements of steel erectors—offer capacities up to 25,000 pounds SLP. For really big lifts, American Air Controlled Hoists, using steam, gasoline, diesel or electric power, deliver tremendous lifting capacity—as much as 60,000 pounds SLP are available in this line!

For 75 years American Hoist has specialized in designing and manufacturing dependable lifting equipment. You choose the top ranked line when you buy American. See your distributor for facts on these hoists!

**Available with 2 or 3 drums and swingers, American's big 90-B General Purpose Hoist has a capacity of 9,000 pounds single line pull. An outstanding lineup of features is offered by this rugged hoist including: anti-friction self-aligning ball bearings; silent chain drive; machined gear teeth; balanced, interchangeable drums easily adjustable, reversible clutch and brake bands.**



**AMERICAN HOIST**
and Derrick Company
St. Paul 7, Minnesota

1882-1957 75 *years of service*

# Construction Reports

## Bids Asked—Low Bidders—Contracts Awarded—

*Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager*
*J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports*
*J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.*

## NEW ENGLAND

### HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
**Central Constr. Co.**, Lawrence, Mass. and **The Henley Lundgren Co.**, 193 Hartford Pike, Shrewsbury, Mass. CA **$2,283,890**, est. $2,931,739, hy. and bridge constr., Rte. 28 to Wood St., Middleboro. Bids Oct. 15. CD 10/18, under LB.

▲ **John Bowen Co., Inc.**, 173 Boston St., Dorchester, Mass., CA **$2,693,739**, est. $2,600,000, South Bay Incinerator Building in Roxbury, BOSTON, MASS. City P. Wks. Dpt., City Hall Annex, Boston, Mass. Bids Oct. 31. CD 11/6, under LB.

## MIDDLE ATLANTIC

### HEAVY CONSTRUCTION—BA

▲ **New York**—BA 12/12—Power Auth. of State of New York, The Coliseum Tower, 10 Columbus Circle, New York, Zone 19, main power plant of Niagara Power Project in Lewiston near Niagara Falls, Contr. N-3. Plans deposit $50. Extended date. Uhl, Hall & Rich, 230 Congress St., Boston 10, Mass. engrs. CD 11/4.

### BUILDINGS—BA

▲† **Md., Perry Point**—BUILDINGS—BA 1/21—Veterans Admin., Munitions Bldg., Wash., D. C., bldg and utilities addns., alterations Veterans Admin. Hospital; $2,000,000-$3,000,000. James R. Edmunds, Jr., 1025 St. Paul St., Baltimore, Zone 2, archt. Bids Apr. 16 rejected. CD 8/18.

### HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany,
N. Y.—**Callanan Road Imprvt. Co.**, Quarry South, South Bethlehem, N. Y., CA **$1,118,752**, est. $1,225,000. reconstr. Rte. 7 from Latham Traffic Circle eastward 2.39 mi. to Grotto Court just inside Watervliet city line, Albany Co.;
N. Y.—**S. J. Groves & Son Co.**, Court St. Rd., Syracuse, N. Y., CA **$2,265,262**, reconstr 6.27 mi. ½ section Route 60 and 1.83 mi. access roads between Laona and point just south of Cassadaga, excepting short stretch thru Cassadaga, incl. 68 ft. concrete arch bridge over Canadaway Creek, Chautauqua Co.;
N. Y.—**DeLillo Constr. Co., Inc.**, 100 E. Old Country Rd., Hicksville, N. Y., CA **$2,056,479**, est. $2,273,000. reconstr. 2.47 mi. section 6-lane divided Rte. 107 and 1.29 mi. access roads from Herzog Pl. near L.I.R.R. crossing in Hicksville northwestward to Jericho Turnpike, incl. widening bridge at northern State Parkway, Nassau Co. Grand total $5,449,493. Bids Aug. 29. CD 7/29.

▲† **Burkholder & Burkholder**, 1025 Conn. Ave. N.W., Wash. 6, D. C. CA **$1,569,089** Prompton Dam spillway and outlet works on Lackawanna River near Prompton, PENNSYLVANIA. U. S. Eng., 2635 Abbotsford Ave., Phila., Pa. Bids Oct. 17. CD 10/11.

### BUILDINGS—LB & CA

▲ **Post Homes, Inc.**, 175 West Elm Dr., Woodbury, N. Y., CA **$1,440,000**, 48 HOMES, Jericho Turnpike and Avery Rd., JERICHO, N. Y. Cold Spring Park, c/o Builder.

▲ **Mahony-Troast Constr. Co.**, 790 Bloomfield Ave., Clifton, N. Y., CA nuclear and ore research LABORATORIES, STERLING FOREST, N. Y. Union Carbide Nuclear Co. and Union Carbide Ore Co., c/o Union Carbide & Carbon Corp., 30 E. 42 St., N. Y. 17, N. Y. CD 2/25.

▲ **Costanza Contg. Co.**, 6515 Crescent Blvd., Pennsauken, N. J., LB **$1,857,000**, general contract JUNIOR-SENIOR HIGH SCHOOL, PENNSAUKEN, N. J. Pennsauken Twp. Bd. Educ., Pennsauken, N. J. Bids Oct. 24. CD 10/1.

▲ **Riverdale Homes**, c/o Joachim W. Hilton, archt., 28 Oak Crest Rd., West Orange, N. J., Owner Builds, **$1,530,000**, 90 HOMES, Franklin Ave. at River Rd., PISCATAWAY, N. J.

▲ **ACH Corp.**, 503 Perry St., Ridley Park, Pa., Separate Contracts. **$2,000,000**. RESIDENTIAL DEVELOPMENT, Delmar Dr., etc., FOLCROFT, PA. George Hay, Media, Pa., archt.

▲ **Wilmington Housing Auth.**, 1400 Todds Lane, Wilmington, Del., cancelled bids to have been opened Nov 5, 400-unit Riverside HOUSING, WILMINGTON, DEL. Est. **$5,000,000**. CD 10/11.

## SOUTH

### BUILDINGS—SLC

▲ **Ga., Atlanta**—DORMITORY—Emory University, G. H. Mew, treas., City Office, Candler Bldg., soon lets contract, 3 women's dormitories. Robert & Co. Assocs., 96 Popular St. NW, archts. CD 9/13/56.

### BUILDINGS—LB & CA

▲ **Zarel Building Corp.**, 925 Lincoln Rd., Miami Beach, Fla., CA Approx. **$3,000,000**. 300 RESIDENCES, CAROL CITY, FLA. Rhyne Properties, c/o general contractor. Maurice S. Weintraub, 235 Lincoln Rd., Miami Beach, Fla., archt.

## MIDDLE WEST

### HEAVY CONSTRUCTION—BA

▲ **Mich., Detroit**—BA 12/10—City, Glenn C. Richards, comr. P. Wks., City-County Bldg., Contract PW-2194, Section I, concrete sewers in tunnel in Livernois from Joy Rd. to Fullerton; Contract PW-2195, Section II, concrete sewers varying in size built in tunnel in Livernois from Fullerton to Puritan. Plans deposit $50. M. F. Wagnitz, city engr. CD 10/3.

### BUILDINGS—BA

▲ **Wis., Port Washington**—HOSPITAL—BA 12/4—St. Alphonsus Hospital, The Sisters of the Order of the Sorrowful Mother, 743 N. Montgomery St., two 6 story 85 ft. wing addn. and remodel hospital, $2,650,000. Brust & Brust, 135 W. Wells St., Milwaukee, Zone 3, archts. CD 4/24.

▲ **O., Hamilton**—SCHOOLS—BA 12/12—Bd. Educ., 322 Dayton Ave., Taft High School, $2,400,000 Garfield High School, $2,400,000. Hamilton Assn. of Architects, Hamilton, O., archts. CD 6/6.

### HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—Dpt. Hys., Columbus, Zone 15, Bids opened 10/29.
O.—**C. E. Edgington & Son**, 913 S. Main St., Findlay, O., LB **$141,419**, est. $177,600 (11 bidders) Type T-35 on B-20 and structure 0.946 mi. USR 62-14.90; SR 661-(11.12-11.58) S-52 (4), Licking Co.;
O.—**W. L. Johnson Constr. Co. & Assoc.**, P.O. Box 6668, Bexley Station, Columbus, O., LB **$1,917,855**, est. $2,088,000 (11 bidders) Type T-71 and structures 4.943 mi. USR 40-7 96, I-1097 (5), Montgomery Co.;
O.—**George A. Trombley & Son**, 2415 Bryne Rd., Toledo, O., LB **$162,718**, est. $214,700 (8 bidders) Type T-35 on B-119 and structure 0.306 mi. SR 590-2.19, S-1205 (1), Ottawa Co.;
O.—**L. R. Skelton**, 3099 Sullivant Ave., Columbus, O., LB **$223,906**, est. $296,300 (16 bidders) Type T-35 on B-20, 1.572 mi. SR-75-(8.62-9.86) F-429 (3), Perry Co.;
O.—**Vernon Nagel**, Park Lane Dr., Napoleon, O., LB **$134,941**, est. $178,000 (12 bidders) Type T-35, 0.689 mi. SR 101-(5.00-5.23) S-717 (2), Seneca Co.;
O.—**The Great Lakes Constr. Co.**, Box 2278, Brooklyn Station, Cleveland, O., LB **$2,743,753**, est. $3,102,750 (8 bidders) Type T-71 and structures 3.58 mi. SR-8-11.17 I-1093 (1), (City of Canton), Stark Co.;
O.—**The McCourt Constr. Co.**, 720 Home Ave., Akron, O., LB **$352,241**, est. $390,100 (4 bidders) Type T-35 1.442 mi. SR 91-12.09, F-662 (1), (Village of Stow), Summit Co.;
O.—**The Ohio Engineering Co.**, 105 Sixth St., Lorain, O., LB **$796,000**, est. $923,800 (4 bidders) Type T-35, 11.925 mi. USR 23-(12.10-21.59) 22.41-23.04 F-453 (5) F-613 (9), (Villages of Upper Sandusky and Carey), Wyandot Co.;
O.—**Nilen Black, Inc.**, 706 E. Highland Ave., Wooster, O., LB **$100,030**, est. $122,500 (11 bidders) Type T-35 and structure 0.337 mi. SR 77-(26.75-26.95), Coshocton Co.;
O.—**The Trimmer Constr. Co., Inc.**, 344 N. Hague Ave., Columbus, O., LB **$116,106**, est. $125,800 (3 bidders) Type T-35, 0.961 mi. SR 161-(7.93-8.21) (City of Worthington), Franklin Co.;
O.—**Shelly & Sands, Inc.**, Thornville, O., LB **$177,496**, est. $200,400 (4 bidders) Type T-35, 3.837 mi. SR 266-(0.00-3.77) (Village of Stockport), Morgan Co.;
O.—**John R. Jurgensen Co.**, 3535 Roundbottom Rd., Cincinnati, O., LB **$118,563**, est. $114,660 (2 bidders) Type T-3, B-35, T-35, 12.89 mi. Butler and Hamilton Counties.
O.—**Pinckney P. Brewer & Sons Co.**, 7455 Dawson Rd., Cincinnati, O., LB **$101,455**, est. $94,770 (2 bidders) Type T-30, B-35, T-35, 7.88 mi. Hamilton Co. CD 10/16.

▲ **Square & Marra Constr. Co.**, Bedford, O., LB **$4,152,353**, est. $3,256,000, (2 bidders) storm sewerage sys., in Kingsbury Run, CLEVELAND, O. City, City Hall, Cleveland, O. CD 7/19.

▲ **Thomas McQueen Co.**, 1313 Circle St., Forest Park, Ill. LB **$1,069,623**, interchange at Montrose Ave., grade separation over Edens Expressway 3 span post-tensioned concrete girder and slab Edens Expressway Proj. I-02-2 (10) LB **$1,610,654** interchange Lawrence Ave. and Foster St., Edens Expressway, Proj. I-02-2 (3) CHICAGO, ILL. Cook Co., County Bldg., Chicago, Ill. Bids Nov. 5. CD 10/28;
**Cassidy Constr. Co.**, 228 N. La Salle St., Chicago, Ill. LB **$548,800**, storm sewer 4,790 lin. ft. from Des Plaines River to Circle Ave. Congress St. Expressway Proj. No. I-01-4 (15), Maywood (Chicago, Ill.);
**Palumbo Excavating Co.**, 2738 W. Harison Co., Chicago, Ill. LB **$1,183,543**, paving N. of Bryn Mawr to Lawrence Ave., 6,542 ft. Edens Expressway Proj. I-02-2 (12) (Chicago, Ill.).

▲ **W. E. O'Neil Constr. Co.**, 2751 Clybourn Ave., Chicago, Ill., CA **$2,097,489**, temp. railroad structures, C. & N. W. grade separation—NW Rte. Superhighway, CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 10/18, under LB.

▲ **A. S. Wikstrom, Inc.**, Mottville St., Box 217, Skaneateles, N. Y. CA **$2,825,250**, Sect. A; raw water intake structure, incl. rock tunnel and land tunnel, open caisson, DETROIT, MICH. Bd. Comrs., Wayne Co., City-County Bldg., Detroit, Mich. Bids Sept. 11. CD 9/19, under LB;
**Santucci Constr. Co.**, 5025 Church St., Skokie, Ill., and **Louis Garavaglia**, 24240 Mount Rd., Center Line, Mo., and **Fattore Co.**, 650 11 mile Rd., Center Line, Mo. CA **$5,912,350**, Item 3, Sect. 3, land tunnel, approx. 15,745 ft. long, under Riverbank Ave. and Riverbank Ave. extended, from Detroit River to plant site at Moran Ave. and Vine Ave. in Allen Park. Bids Sept. 11. CD 8/2 (Detroit, Mich.);
**James McHugh Constr. Co.**, 6449 S. So. Park Ave., Chicago 37, Ill. CA **$2,359,400**, Item 2, Sect. B, tunnel in rock below the Detroit River approx. 5,260 ft. long and shore shaft, Bids Sept. 11. CD 8/2 (Detroit, Mich.).

### BUILDINGS—LB & CA

▲ **Marvin Half, Inc.**, 10001 Carnegie Ave., Cleveland 6, O. Own Forces. **$3,000,000**, 300 HOMES Kyle Rd. off Rte. 6, Hampden Township, HAMPDEN, O. Louis J. Rotman, 31715 Vine St., Wickliffe, O., archt. CD 9/24.

▲ **Zehman-Wolf-Sherman Co.**, 13484 Cedar Rd., Cleveland Heights 18, O., CA Est. **$2,000,000**, 35 store 100,000 sq. ft. SHOPPING CENTER, with parking area, East Lake Rd. and Rte. 301, (100,000 sq. ft. to be added at later date) SHEFFIELD LAKE, O. Shoreway Shopping Center, 700 Marshall Bldg., Cleveland 13, O. Sidney H. Morris & Assocs., 134 N. La Salle St., Chicago, Ill., engrs.

### PROJECTS COVERED

#### By Size

**Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.**

#### By Regions & Classes of Construction

**(In order of Listing)**

**BIDS ASKED**
**LOW BIDDERS**
**CONTRACTS AWARDED**

**New England**
**Middle Atlantic**
**South**
**Middle West**
**West of Mississippi**
**Far West**

**PROPOSED WORK**
**Water Supply**
**Sewers, Waste Disposal**
**Bridges**
**Streets & Roads**
**Earthwork, Waterways**
**Public Buildings**
**Mass Housing**
**Commercial Buildings**
**Industrial Buildings**
**Unclassified**

#### In These Stages

**PROPOSED WORK: Before and including appointment of engineers or architects.**

**BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.**

**SOON LETS CONTRACT: SLC**

**LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.**

**CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.**

**CD dates shown are of Construction Daily Issue in which last previous report was published.**

**OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.**

#### Symbols and Abbreviations Include:

| | |
|---|---|
| † | Federal Government |
| ▲ | Project of $1,000,000 or over. |
| ENR | Engineering News-Record |
| CD | Construction Daily |

For additional reports see Construction Daily.

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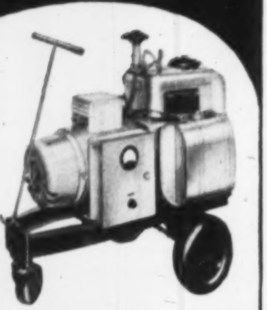

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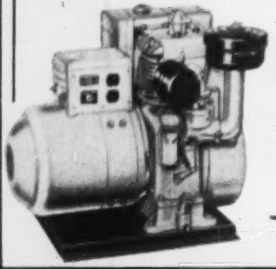

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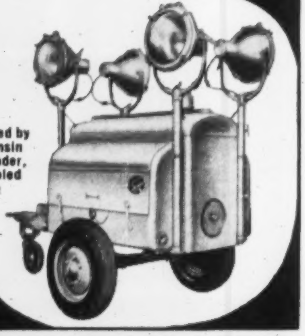

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WATERFORD, NEW YORK

▲ **Steubenville Metropolitan Housing Auth.**, 604 Sinclair Bank Bldg., Steubenville, O., returned unopened bids to have been opened Oct. 31, low-rent HOUSING, Proj. OH-14-1, STEUBENVILLE, O. **$1,500,000.** CD 10/10.

▲ **Enger Bros.**, 4910 W. St. Paul St., Chicago, Ill., CA **$5,007,532** 320,000 sq. ft. 34 acre site, West Layden HIGH SCHOOL, swimming pool and fieldhouse, Grand Ave. and Wolf Rd., FRANKLIN PARK, ILL. School Dist. 12, Franklin Park, Ill. Bids Oct. 30. CD 10/18, under LB.

## WEST OF MISSISSIPPI

### BUILDINGS—BA

▲ **Colo., Colorado Springs**—SCHOOL—BA 2/5—School Dist. No. 11, 406 N. Weber St., Senior High School. $3,500,000. Edward L. Bunts & F. Lamar Kelsey, archts, and John E. Bunts, architectural engr., 213 E. Monument St. CD 12/20/56.

### HEAVY CONSTRUCTION—LB & CA

▲ **COLORADO**—State Hy. Dpt., 4201 E. Arkansas St., Denver,

C. L. **Hubner Co.**, 4800 E. Jewell Ave., Denver, Colo. CA **$1,985,912,** est. $2,212,000. b. conc. 2.003 mi. Colo. Proj. No. 1 092-2 (5), El Paso Co. Bids Nov. 1. CD 10/23.

### BUILDINGS—LB & CA

▲ **Peter Kiewit Sons, Co.**, Omaha National Bank Bldg., Omaha, Neb. CA **$1,877,547.** general constr. Southwest JUNIOR HIGH SCHOOL, 42nd and Bankroft Sts., OMAHA, NEB. Bd. Educ., 3902 Davenport St., Omaha, Neb. Bids Oct. 29. CD 11/4 under LB.

## FAR WEST

### HEAVY CONSTRUCTION—BA

▲ **Calif., Los Angeles**—BA 12/4—Metropolitan Water Dist., 306 W. 3 St., constr. 12 mi. pipe line second San Diego Aqueduct near Temecula, Riverside Co. $5,000,000.

### BUILDINGS—BA

▲ **Calif., Los Angeles**—SCHOOL—BA 12/4—Bd. Educ., 1425 S. San Pedro St., Millikan Junior High School in North Hollywood. $2,100,000. CD 11/9/56.

### HEAVY CONSTRUCTION—LB & CA

▲ **IDAHO**—State Hy. Dpt., Boise,

S. S. **Mullen**, 621 9 St. N., Seattle, Wash., CA **$2,011,540,** constr. roadbed, drainage structures and seven 101.4 ft. concrete bridges on 13.344 mi., Lewis and Nez Perce Counties. Bids Oct. 8. CD 10/16.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened Nov. 7,

Calif.—**Griffith Co.**, 1060 S. Broadway, Los Angeles, Calif., LB **$3,317,563,** grading, and surf. 1.2 mi. 6 and 8 lane divided freeway between 1.2 mi. east of Taylor St. and 0.5 mi. east of U.S. 395 in San Diego and constr. 6 structures reconstr. separation and widening San Diego River Bridge. XI-SD-12, 77-S.D., San Diego Co.;

Calif.—**Winston Bros. Co.**, 1532 S. California Ave., Monrovia, Calif., LB **$2,226,908,** grading, 5.6 mi. and paving 3.4 mi. 4 lane divided freeway between Polk St. and 0.3 mi. north of Arlington Ave. on Rte. 43 in Riverside and constr. 3 overcrossings and 4 undercrossings, VII, Riv-43, B Riv., Riverside Co. CD 10/4.

### BUILDINGS—LB & CA

▲† **Page City Constructors**, Bakersfield, Calif., LB **$3,157,580,** two hundred 3 bedroom RESIDENCES for Page, Ariz., Colorado River Storage Proj., Middle River Division, Spec. DC 4989, ARIZONA. Bureau Reclamation, Dpt. Interior, Kanab, Utah. Bids Nov. 7. CD 10/28.

▲ **Arthur M. Andersen Corp.**, 2137 N. Marianna St., Los Angeles, Calif., CA Total est. **$10,000,000** Los Altos Square Entertainment Center, incl. theatre, restaurant, stores and offices, LONG BEACH, CALIF. David H. Jones, 9212 Cordell Dr., Hollywood, Calif. Miller, Royer & Kite, 9952 Santa Monica Blvd., Beverley Hills, Calif., archts.

## LATIN AMERICA

### BUILDINGS—LB & CA

▲ **British Thomson-Houston, Metropolitan Vickers and International Combustion Ltd.**, London, England, CA Est. **$98,000,000.** POWER PLANT with 120,000 kw. turbo alternators and auxiliary equipment at BUENOS AIRES, ARGENTINA. Ministry of Commerce & Industry, Buenos Aires, Aregntina. Merz & McLellan, engrs. for plant and Sir William Halcrow & Partners, engrs. for civil works, both London, England. CD 4/22.

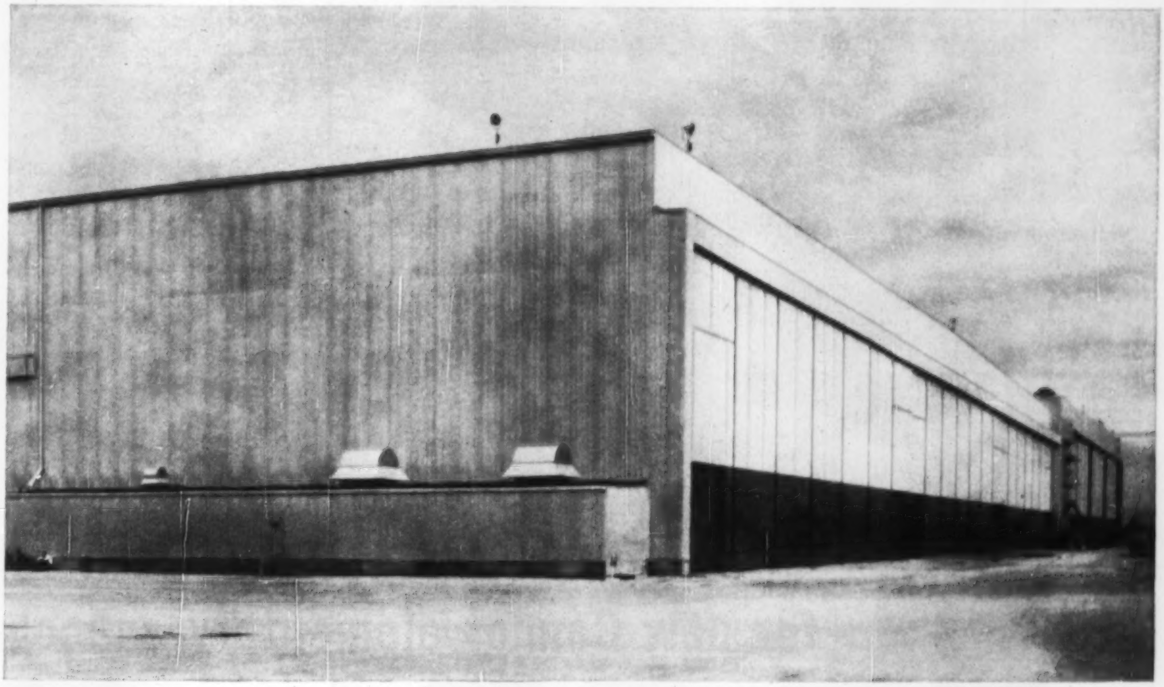
# PROPOSED PROJECTS

## SEWERS, WASTE DISPOSAL

▲ **Md., Towson**—Baltimore County Executive, County Office Bldg., Zone 4, sewerage sys. to serve Back River area consisting 48 in. interceptor from Deep Creek to Essex pumping station. **$6,000,000.** Constr. Spring 1958, Proj. to take 8 to 10 years. John B. Funk, c/o owner, ch. engr.

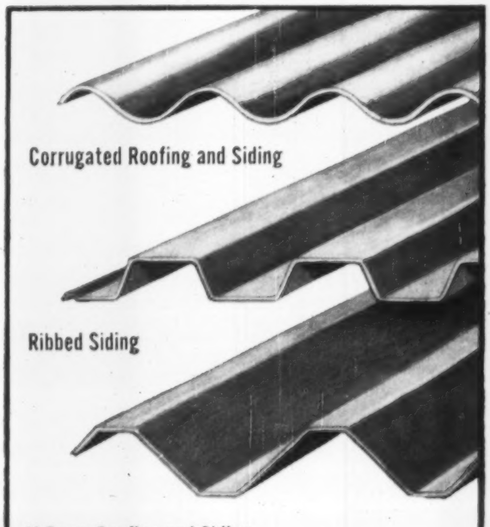
▲ **Mo., Liberty**—City, L. D. Williams, mayor, City Hall, sewerage sys. imprvs., incl. sewer extens., outfall sewer, pumping station, force main and sewage treatment plant. **$1,407,600.** Haskins, Riddle & Sharp, 1009 Baltimore Ave., Kansas City 5, Mo., consult. engrs.

(Continued on page 97)



**Architect:** Holmes & Garver, Inc., Los Angeles, California
**General Contractor:** C. L. Peck, Los Angeles, California
**Alcoa Approved Applicator:** George D. Widman Inc., Gardena, California.

# Super-Size Insulated Sheet of Alcoa Aluminum Speeds Erection of Douglas Jet Plant



Because they're a full 32′ long, insulated sheets of Alcoa® Aluminum used in the new Douglas jet transport plant in Long Beach, California, slashed erection time dramatically. Less on-site labor was needed, lighter structural framing was required and Douglas was able to start production sooner.

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## selected because of versatility for new Candor elementary school

According to the architects, "In designing the Candor Elementary School we selected the LIGHTSTEEL framing system because of its versatility and its speed of construction. It was our feeling that the simpleness of the design lent itself to the wall-bearing system and we felt that we might reduce the cost by reducing the length of construction time."

Designed to accommodate 420 pupils, the school contains 3 kindergartens, 1 special teaching room, 11 elementary classrooms, library, office suite, cafeteria and 36′ x 52′ gym. 10″ LIGHTSTEEL joists were used for roofs and 3⅝″ double studs for load-bearing walls.

Exterior is brick and stucco. To reduce the possibility of cracking of the stucco, Penmetal Expansion Joint was placed vertically on 4′ centers around the outside of the building.

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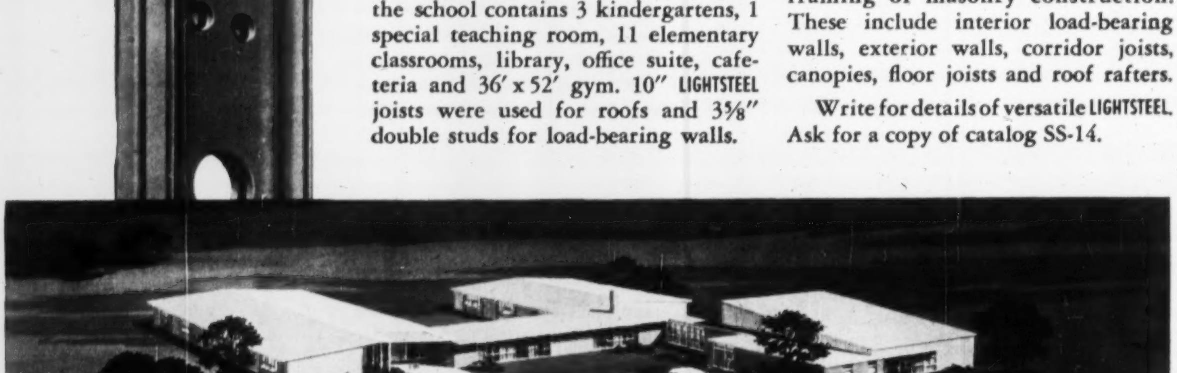

*Sargent-Webster-Crenshaw & Folley Architects A.I.A.*

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Penmetal

PM-145

(Continued from page 94)

- ▲ **Pa., Emmaus**—Borough of Emmaus, sanitary sewerage sys. **$3,265,000.**
- ▲ **Tenn., Chattanooga**—City, enlargement of Brainerd sewage treatment plant and 40,000 ft. lines in new incorporated area and allied imprvs. **$3,500,000.** Schmidt Engineering Co., 817 Broad St., consult. engr.
- ▲ **Wash., Everett**—City, City Hall, exten. sewerage sys. **$2,000,000.** CD 10/23/52.

## BRIDGES

- ▲ **O., Barberton**—City, City Hall, Viaduct-Bridge over Tuscarawas River, Ohio Canal, etc. to connect Robinson Ave. and Wooster Rd. W., linking E. Barberton with downtown. **$1,800,000.** Burgess & Niple, 2015 W. Fifth St., Columbus, consult. engrs. CD 8/30/44.

## STREETS AND ROADS

- ▲ **Ill., Waukegan**—City, Lakefront Industrial Hy. for Waukegan to Great Lakes Naval Training Center. **$15,000,000.** Bleck, Staben & Thacker, 226 Washington St., consult. engrs.

## AIRPORTS

- ▲ **Tenn., Memphis**—AIRPORT TERMINAL, etc.—Memphis Airport Comn., City Hall, airport terminal, **$4,000,000,** constr. 1959; new runway and tunnel on Winchester Ave. at Mfs. Municipal Airport, **$2,000,000;** access roads, parking lots, apron utilities, lighting for Memphis Municipal Airport, **$1,500,000;** airport traffic control tower for CAA, **$175,000.** Allen Hoshall, 65 McCall Place, consult. engr. for 1st 2 projects. CD 12/31/56.

## PUBLIC BUILDINGS

- ▲ **Calif., Auburn**—COLLEGE FACILITIES—Placer Union High School Dist. and Sierra College Dist., 138 Maple St., voted bonds Oct. 22, exten. college facilities. **$3,040,000.** Gordon Stafford, 1024 J St., Sacramento, archt. CD 8/22.
- ▲ **Calif., Glendale**—POLICE AND JAIL—City Council, City Hall, plans by Raymond Jones, 518 E. Glenoaks Blvd., 2 story police and jail bldg., Wilson and Isabel Sts. **$1,000,000.** CD 8/29/49.
- ▲ **Calif., Grossmont**—SCHOOL—Grossmont Union High School Dist., Grossmont, voted $2,000,000 bonds Oct. 15, new high school and addns. to high schools. **$4,500,000.** Herluf Brydegaard, 1634 6th Ave., San Diego, archt. CD 10/26/55.
- ▲ **Calif., Martinez**—EDUCATION—Contra Costa Junior College, 1005 Escobar St., plans by Warnecke & Warnecke, Financial Center Bldg., Oakland, education bldg. at East Contra Costa Junior College. **$1,000,000.** CD 8/11/52.
- ▲ **Calif., San Francisco**—HOUSING—San Francisco Housing Auth., 440 Turk St., plans by Wm. Mooser Sr.; Wm. Mooser, Jr., & Donald Francis Haines, 681 Market St., **(1)** 170 units at Haight, Page, Webster and Buchanan St. **(2)** 140 units Fell, Webster, Hayes, Linden and Buchanan **(3)** 18 units at Sunnydale Proj. **$4,136,000.**
- ▲ **Calif., San Francisco**—MEDICAL STUDENTS—University of California, Bd. Regents, Admin. Bldg., Berkeley, plans by Clark & Beuttler & George Rockrise, 552 Mission St., married medical students bldg. near existing University of California Medical Center. **$2,000,000.** CD 8/24/44.
- ▲ **Colo., Littleton**—SCHOOLS—Bd. Educ., Littleton, Colo., bond election Nov. 25, constr. of schools and addns. **$4,615,000.**
- ▲ **Conn., Bridgeport**—SCHOOL—Town, Town Hall, Plans by J. Gerald Phelan, 211 State St., North End Elementary School, Reservoir Ave. **$1,000,000.** Fletcher-Thompson, Inc., 211 State St., consult. engr. CD 10/21.
- ▲ **Conn., Bristol**—SCHOOL—Town, revised plans by Harold A. Hayden, 175 Main St., high school, **$3,500,000,** John P. Legnos, 30 Gillett St., Hartford, consult. engr. CD 8/1, under LB.
- ▲† **D. C., Wash.**—NATURAL HISTORY—General Services Admin., General Services Bldg., Zone 25, plans by Petticord & Mills, 3308 14 St. N. W., 2 addns. to Natural History Bldg., Smithsonian Institute, Constitution Ave. between 9 and 12 Sts. **$14,000,000-$15,000,000:** (no appropriation). CD 3/23/56.
- ▲ **Ill., Blue Island**—HIGH SCHOOL, etc.—School Dist. 218, 127th and Sacramento Sts., plans by Nicol & Nicol, 23 E. Jackson Blvd., Chicago, 1 and part 2 story, Unit 4, high school and gym, Ridgeland and 115th Sts. **$1,000,000.**
- ▲ **Ind., Peru**—HOSPITAL—Bd. Trustees Dukes-Miami Hospital, Peru, 50 bed unit hospital addn. with x-ray, laboratory, obstetrical dpt., kitchen, surgical rooms, etc. **$1,000,000-$1,500,000.** Hope to raise 2/3 cost thru bond issue.
- ▲ **Kan., Lawrence**—BUSINESS, etc.—State Dpt. Admin., Topeka, plans by John Brink, state archt., Topeka, business and economics building at University of Kansas. **$1,000,000.** Bids in December.
- ▲ **Md., Baltimore**—SCHOOL—City, Bureau Bldg. Const., 410 Municipal Bldg., plans by C. H. Hebrank, 2111 N. Charles St., 1 and 3 story, brick, concrete, steel, block, (Barclay Elementary School, formerly Oriole Park Elementary School) 29th and Barclay Sts. **$1,000,000.** Bids in November. CD 5/23/56.
- ▲ **Mass., Arlington**—SCHOOL—Town, Supt. Schools, 23 Maple St., plans by Korslund, LeNormand & Quann, Inc., 506 Washington St., Norwood, Senior High School. **$1,200,000.** Bids in December. Constr. 1958.

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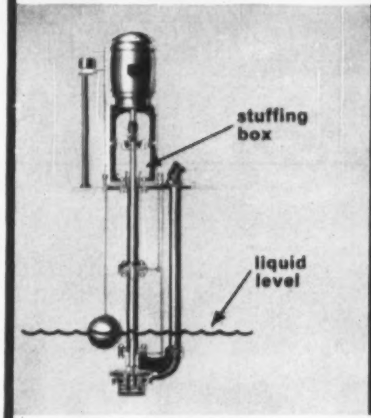
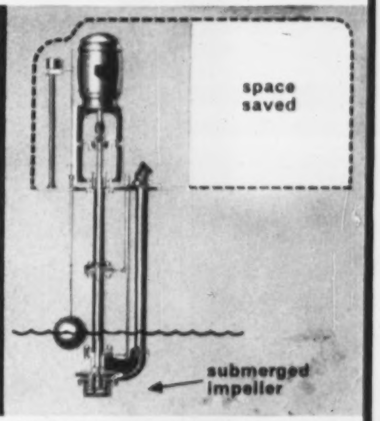


**ELIMINATE LEAKAGE.** Stuffing boxes and seals are not under liquid pressure. With the Yeomans Vertical Wet Pit Pump there are no costly, annoying, or dangerous liquid leaks, as with horizontal pumps.



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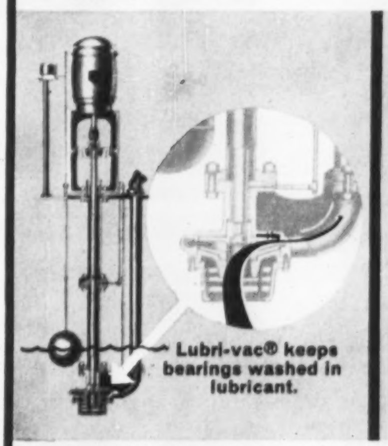

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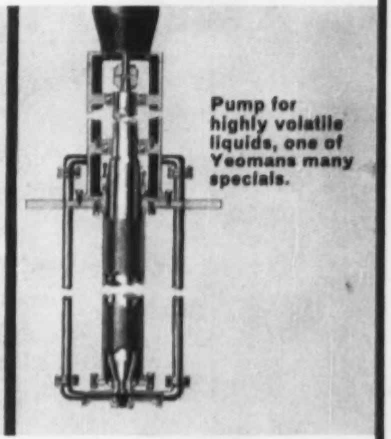
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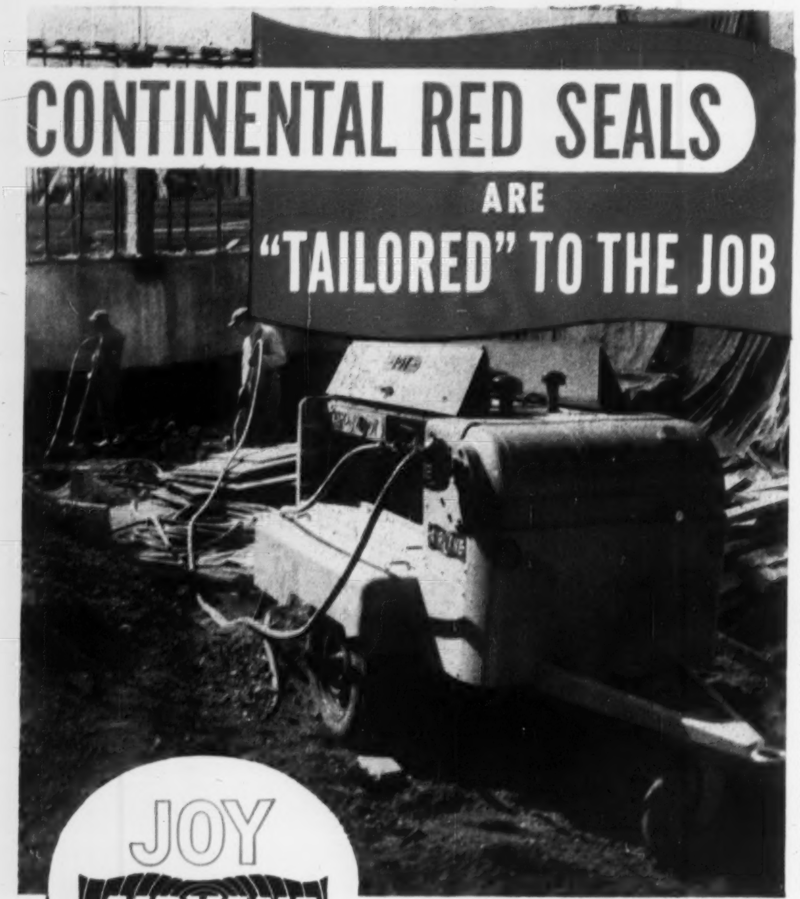

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▲ **Mass., Reading**—SCHOOL—Town, School Dpt., Lawrence H. Partelow, chn., Jr. High School Bldg. Comm., plans by Adden, Parker, Clinch & Crimp, 177 State St., Boston, Junior High School. **$1,000,000**. Constr. 1958.

▲ **Mass., Weymouth**—SCHOOLS—Town of Weymouth, Supt. Schools, 111 Middle St., East Weymouth, North Senior High School and Vocational School, near present Senior High School. **$1,000,000**. Constr. 1958.

▲ **Mich., Kalamazoo**—LIBRARY-MUSEUM—City, Bd. Educ., plans by Louis C. Kingscott & Assocs., 511 Monroe St., library-museum bldg. **$1,500,000**. Bids soon. CD 10/11/55.

▲ **Mich., South Redford**—SCHOOL—Bd. Educ., South Redford School Dist., Lois A. Forter, secy., 26255 Schoolcraft Rd., Detroit, Zone 39, voted **$1,800,000** bonds for site to build and equip. Junior High School,

▲ **Minn., Chatfield**—SCHOOL, etc.—Bd. Educ., E. S. Gordon, clk., voted $1,320,000 bonds Oct. 26, new high school, **$1,000,000**; swimming pool, **$170,000**, etc. Swanson & Wegleitner, 520 Sexton Bldg., Minneapolis, archts. Constr. 1958. CD 1/11.

▲ **Neb., Omaha**—SCHOOL—Bd. Educ., 3902 Davenport St., plans by L. A. Daly Co., Insurance Bldg., Northside Junior High School, Florence Blvd. and Pratt St. **$2,260,000**. Bids in March or April. CD 4/8.

▲ **Neb., Omaha**—PARKING GARAGE—City of Omaha and Douglas Co., underground parking project under court house lawn. Over **$1,000,000**. George Barton & Assoc., Evanston, Ill., L. A. Daly Co., Insurance Bldg. Omaha, Neb. consult. engrs. Wm. Green, Omaha, co. engr. E. W. Woodbridge, Omaha city engr. CD 6/4.

▲ **N. J., Bloomfield**—SCHOOL—Bd. Educ. plans by Micklewright & Mountford, E. Stuyvesant Ave., Trenton, 1,000-student Junior-Senior High School, on 30 acre tract, Brookdale Sections. **$3,000,000**. CD 11/5/43.

▲ **N. J., Vineland**—SCHOOL—Bd. Educ., bond election Dec. 10, high school. **$4,400,000**. Ralph E. Hacker, 854 River Rd., New Milford, archt.

▲ **N. J., West New York**—HOUSING—West New York Housing Auth., 581 Park Ave., plans by Ricker & Axt, 6115 Hudson Ave., 7 story old age housing to consist of 2 bldgs., containing 80 apartments, known as Sunset Gardens on plot bounded by Jackson, Adams, 62nd and 63rd Sts. **$1,800,000**. Expect to ask for bids in March and start constr. in May 1958.

▲ **N. Y., Bethpage**—SCHOOL—Bd. Educ. voted bonds Oct. 19, Junior and Senior High School, Broadway at Cherry Ave. **$4,500,000**.

▲ **N. Y., New York**—HOSPITAL—Dpt. P. Wks., Municipal Bldg., Zone 7, plans by Pomerance & Breines, 33 W. 46 St., Zone 19, and Katz, Waisman, Blumenkranz, Stein & Weber, 33 W. 46 St., Zone 19, Proj. HO-145B, 750-bed Bellevue Hospital replacement, connection to existing hospital laboratory and x-ray facilities, for Dpt. Hospitals. **$22,000,000**. To go ahead in 1961. CD 6/5.

▲ **Pa., Glenolden**—SCHOOL—Glenolden, Pa. Bd. Educ., plans by Harry G. Stewart, 117 S 17th St., Phila., Junior-Senior High School. **$1,420,000**. Bids soon. CD 11/10/55.

▲ **Tenn., Memphis**—HOSPITAL—City, constr. radiology and central services bldg. in medical center. **$2,000,000**. Constr. 1959. CD 7/9.

▲ **Tex., Dallas**—SCHOOL—Dallas Ind. School Dist., 3700 Ross, classroom bldg., **$1,500,000**; library admin., **$750,000**; laboratory, **$400,000**, part of a new proposed Jr. College.

▲ **Tex., Denton**—MUSIC, etc.—North Texas State College, music bldg., **$870,800**; industrial arts bldg., **$784,000**; physics and mathematics bldg., **$585,500**; business administration bldg., **$1,265,000**; home economics and classrooms, **$519,500**.

▲ **Wis., Racine**—SCHOOL—Bd. Educ. plans by Warren Holmes, 2200 Michigan Natl. Tower, Lansing, Mich., Jerstad-Agerholm Junior High School. **$2,000,000**. Bids in March.

▲ **Wyo., Cheyenne**—SCHOOL—Cheyenne School Dist., high school, **$2,800,000**; 1 elementary school and 4 elementary school addns., **$1,000,000**.

▲ **Ont., Lockerby**—SCHOOL—Nickel Dist. Collegiate Institute Bd., Lockerby, School, Walford Rd. near Hy. No. 69. **$1,180,000**.

## COMMERCIAL BUILDINGS

▲ **Calif., Los Altos**—DIAL—The Pacific Telephone & Telegraph Co., 140 New Montgomery St., San Francisco, dial bldg. **$1,400,000**.

▲ **Calif., Sacramento**—BANK—Bank of America, c/o Continental Service Co., 870 Market St., San Francisco, plans by Wurster, Bernardi & Emmons, 202 Green St., San Francisco, 3 story, full bsmnt. and large roof deck and parking facilities, bank bldg. **$2,000,000-$3,000,000**. L. H. & B. L. Nishkian, 1045 Sansome St., San Francisco, consult. engrs. Bids in Spring.

▲ **Calif., San Rafael**—SHOPPING CENTER—Abe Blumenfeld, Bayview Rd., plans by Harold F. Wise & Assoc. (planning consult.), 546 University Ave., Palo Alto, 17 stores, patio type, shopping center 4th St., to replace a portion of business dist. recently destroyed by fire. **$3,000,000**.

▲ **Conn., Hartford**—OFFICE AND STORES, etc.—William Zeckendorf, 383 Madison Ave., New York, N. Y., 30 story office bldg., East Side Development Project, **$3,000,000**; department stores with off-street parking facility, totaling 160,000 sq. ft. and offices atop parking facility, East Side Development area, **$2,000,000**; 130,000 sq. ft. store bldg., East Side Development Area, **$1,300,000**; 5 story office bldg. for Federal Agencies, **$500,000**.

▲ **Iowa, Grinnell**—FINE ARTS CENTER, etc.—Grinnell College, Grinnell, Fine Arts Center, **$1,100,000**; Library, **$1,200,000**.

▲ **Kan., Topeka**—HOSPITAL, etc.—Minninger Foundation, 3617 W 6 St., plans by Joseph Murphy & Eugene Mackey, 4746 McPherson St., St. Louis, Mo., psychiatric hospital for children and a research bldg. **$2,780,000**.

▲ **Md., Takoma Park**—UNIVERSITY—General Conference of the Seventh-day Adventist Church, 6840 Eastern Ave., plans by Ronald Senseman, 7705 Georgia Ave., Silver Spring, constr. Potomac University, Carroll Ave. and University Blvd. **$1,250,000**.

▲ **Mass., Lowell**—MONASTERY—Poor Clare Monastery, c/o Chancery Office, 1 Lake St., Brighton, plans by John A. McPherson, 250 Huntington Ave., Boston, Poor Clare Monastery, West Andover. **$1,000,000**. Constr. 1958. CD 6/28.

▲ **Mass., Springfield**—HOSPITAL—Springfield Hospital, 759 Chestnut St., plans by James H. Ritchie & Assoc., 135 Clarendon St., Boston, hospital addn., alterations. **$1,500,000**. Bids in November. CD 8/1/56.

▲ **Mass., West Roxbury**—SCHOOL—The Irish Christian Brothers, Moseley on the Charles, Dedham, high school, **$1,350,000**. Constr. 1958.

▲ **Mass., Worcester**—CHURCH, etc.—St. George Syrian Orthodox Church, Rev. Thomas Ruffin, pastor, 34 Wall St., church and community center, Belmont and Plantations Sts. **$1,000,000**. Constr. 1958.

▲ **Mich., Flint**—AUDITORIUM, etc.—Industrial Mutual Assn., Hubert L. Curtis, pres., 551 James P. Cole Bldg., auditorium, incl. offices, veterans service department, stores and warehouse space, meeting rooms. **$1,500,000**.

▲ **N. J., Ridgewood**—HOSPITAL—Valley Hospital, Linwood Ave., 4 story hospital addn. Linwood Ave. and North Van Dien Ave., **$2,500,000**. Constr. in Spring. CD 6/22/56.

▲ **N. Y., Brooklyn**—APARTMENTS—William Lintz, c/o Martyn & Don Weston, archts., 44 Court St., Brooklyn, Zone 2, two 6 story apartments, 8502 Narrows Ave. and 8365 Shore Rd., **$1,200,000**.

▲ **N. Y., New York**—APARTMENT—Carol Management Corp., 12 E. 48 St., Zone 17, apartment, 210 Central Park South. **$1,000,000**.

▲ **O., Hiram**—RECREATION CENTER, etc.—Paul F. Sharp, pres., Hiram College, plans by Richard Hawley Cutting & Assocs., Inc., 2074 E. 36th, Cleveland, Recreation Health Center at Hiram College, at foot of Squire Hill, next to football field, incl. gym., swimming pool, field house, classrooms, etc. **$1,000,000**.

▲ **O., Shaker Heights**—OFFICE—Allstate Insurance Co., 7447 Skokie Blvd., Skokie, Ill., plans by Garfield, Harris, Shafer, Flynn & Williams, 1740 E. 12 St., Cleveland, Zone 14, 1 story, 60,000 sq. ft. brick, stone, regional office bldg., with offstreet parking facilities, **$1,000,000**. Bids in about 6-8 wks. CD 5/10.

▲ **Tex., San Antonio**—DWELLINGS—John M. Schaefer, 311 Travis Bldg., plans by DeVerne Kittles, 523 W. Hildebrand, 2nd unit, 150 low prices "speculative" dwellings, in Wheatley Heights. **$1,050,000** Constr. 1958.

▲ **Alta., Edmonton**—HOUSING—Central Mortgage & Housing Corp., 56 Lyon St., Ottawa, Ont., 280 low rental housing, **$2,276,237**. Federal Govt. loan.

▲ **Alta., Edmonton**—DEPARTMENT STORE—T. Eaton Co. of Canada Ltd., 101st St. and 102nd Ave., 2 story, full rein.-con. bsmt., L-shaped steel, masonry department store exten., 101st St. and 102nd Ave. **$3,000,000**.

▲ **Man., Winnipeg**—APARTMENTS, etc.—Chamberlain Development Ltd., c/o Dpt. P. Wks., Hunter Bldgs., Ottawa, Ont., 96 three bedroom row houses and 46 two bedroom apartments. **$1,179,283**. Federal Govt. loan.

▲ **Ont., Ottawa**—HOUSES—Parkview Gardens Ltd., c/o Central Mortgage & Housing Corp., 56 Lyon St., Ottawa, Ont., 129 three bedroom row houses and 16 three bedroom semi-detached houses, **$1,433,000**. Federal Govt. loan.

▲ **Que., Montreal**—HOSPITAL—LaSalle General Hospital, c/o Dr. M. Lacharite, 7667 LaSalle Blvd., 100-bed hospital, Champlain Blvd., LaSalle. **$1,500,000**.

## INDUSTRIAL BUILDINGS

▲ **Ind., Huntington**—PLANT—Our Sunday Visitor Publishing Co., Huntington, 300,000 sq. ft. floor space printing plant on 13 acre site at northeast edge of town. **$3,000,000**.

▲ **Tex., Houston**—INDUSTRIAL—Texas Instruments, Inc., 6000 Lemmon St., Dallas, plans by O'Neil Ford, 528 King Wm. St., San Antonio, Richard Colley, 310 S. Tancahua St., Corpus Christi, and A. B. Swank, 2611 Cedar Springs, Dallas, doubling capacity by 300,000 sq. ft. masonry constr. of existing (recently built) industrial bldg. (mfg. germanium transistors and imprv. silicone transistor). Approx. **$2,500,000**.

## UNCLASSIFIED

▲ **Colorado**—RURAL DISTRIBUTION LINES—Colorado-Ute Electric Assn., Montrose, 30 addnl. mi. 44 KV transmission lines, Ute Co. **$2,000,000**.

▲ **Tex., Amarillo**—MALL—City, City Hall, Downtown Mall (to eliminate Polk St. mile long Mall, landscaping, etc. in shopping area). **$1,000,000**.

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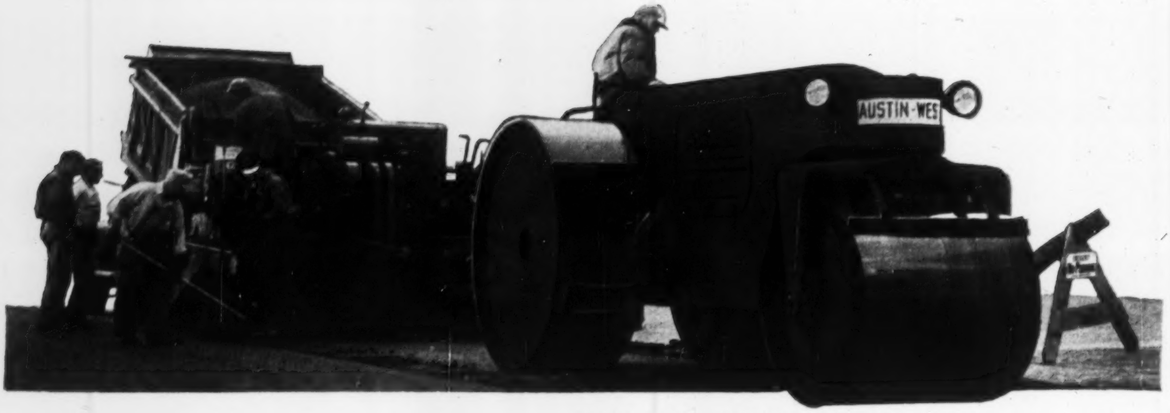

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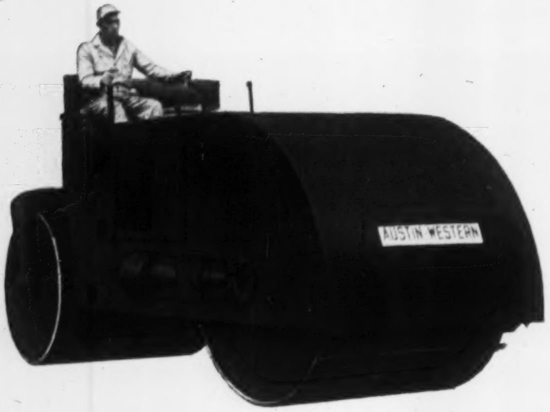

### THE A-W TANDEM ROLLER

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- **All transmission gears are machine cut and heat treated**
- **Entire transmission is equipped with antifriction bearings**
- **3-wheel rollers have heat-treated alloy steel bull pinions and high strength steel bull gears**
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# Bids—Low Bids—Contracts—Second Section

## NEW ENGLAND

### HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
December 2 Connecticut December 3 Massachusetts

### BUILDINGS—BA

▲ **Conn., Bloomfield**—HIGH SCHOOL—BA 12/4—Town, Town Hall, Junior High School. $1,000,000. Russell & Gibson, 1005 Farmington Ave., Hartford, archts. A. John Macchi, 57 Farmington Ave., West Hartford, engr. CD 7/2.

### BUILDINGS—SLC

▲ **Conn., New London**—HOSPITAL—BA 11/19—Lawrence & Memorial Associated Hospitals, Montauk Ave., 2 hospital wing addns. $3,500,000. Soon lets contract. York & Sawyer, 101 Park Ave., New York, N. Y., archts. Jansen & Rogan, 500 Fifth Ave., New York, N. Y., engrs. CD 10/23.

### BUILDINGS—LB & CA

▲ **Stone & Webster Engineering Corp.**, 49 Federal St., Boston, Mass., CA Total est. **$57,000,000**, design and construct ATOMIC POWER PLANT, Rowe, MASSACHUSETTS. Yankee Atomic Electric Co., 441 Stuart St., Boston, Mass. CD 6/8/56, under CA.

▲ **Daniel O'Connell's Sons, Inc.**, 480 Hampden St., Holyoke, Mass., LB **$1,865,163**, Regional HIGH SCHOOL near Southboro Town Line, NORTHBORO, MASS. Northboro-Southboro Regional School Dist., c/o Supt. Schools, Howard St., Northboro, Mass. Bids Nov. 7. CD 10/8.

▲ **Bregman Constr. Corp.**, 250 E. 43rd St., New York, N. Y., LB **$2,147,320** (13 bidders) STATE PRISON, (first stage) SOMERS, CONN. State P. Wks., Dpt., 165 Capitol Ave., Hartford, Conn. Bids Nov. 13. CD 10/9.

▲ **Wadhams & May Co.**, 15 Lewis St., Hartford, Conn., CA **$1,800,000**, HIGH SCHOOL and baseball and football fields, WINSTED, CONN. Town of Winchester, Gilbert School Trustees, Park Place, Winsted, Conn. Bids Aug. 22. CD 9/11, under LB.

## MIDDLE ATLANTIC

### BUILDINGS—BA

▲ **N. Y., Kew Gardens**—CRIMINAL COURTS—BA 11/27—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Contr. B-1, general constr. work; Contr. B-2, plumbing work; Contr. B-3, heating, ventilating and air-conditioning work; Contr. B-4, electrical work for new Criminal Court Bldg. and Prison, Queens Blvd., Hoover Ave., 132 St. and 82 Ave., Queens Boro. Plans deposit $100. Extended date. CD 11/6.

▲ **N. Y., Rockaway**—HOUSING—BA 12/10—New York City Housing Auth., 299 Broadway, New York, Zone 7, No. 1, foundations and general construction; No. 2, heating and ventilating; No. 3, electrical work; and No. 4, plumbing for Redfern Houses Addition, incl. boiler room alterations in existing Bldg. No. 2 Proj. No. NYS-55, in area bounded generally by Hassock St., Redfern Ave. and Buildings Nos. 5, 2, 3 and 6 of the existing Redfern Houses, Queens Boro. $1,400,000. Plans deposit $75. CD 10/21.

### HEAVY CONSTRUCTION—LB & CA

▲† **Arundel Corp.**, foot of Fulton St., Brooklyn, N. Y. CA **$1,355,000**. removing approx. 151,400 cu. yd. place measurement of ledge rock from New York and New Jersey Channels, Section 4, Area 8A, CIVENG-30-075-58-22, NEW YORK. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Oct. 1. CD 10/4, under LB.

▲ **Frederick Snare Corp.**, 233 Broadway, New York 7, N. Y. LB **$1,798,100**. (6 bidders) Contr. BP-160.012, New Pier 10 substructure and deck, Brooklyn-Port Authority Piers, BROOKLYN, N. Y. The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Nov. 12. CD 10/17.

▲ **Hendrickson Bros., Inc.**, 63 N. Central Ave., Valley Stream, N. Y. CA **$2,687,637**, lateral sewers at New Hyde Park, Garden City Park and vicinity towns of Hempstead and North Hempstead Sewage Collection Dist. N1.2-NHP-2, Contr. 1002-2-NHP-2, MINEOLA, N. Y. Nassau Co. Executive, Nassau Co. Old Court House, Mineola, N. Y. Bids Oct. 15. CD 10/21, under LB.

**Slattery Foundation Corp.**, 46-36 54th Road, Maspeth, N. Y. LB **$939,500**. (12 bidders), placement of fill for the new State Hospital, Hutchinson River Parkway, Bronx Boro, NEW YORK, N. Y. State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. CD 4/30, under Public Buildings.

▲ **Dpt. P. Wks., Westchester Co.**, County Office Bldg., White Plains, N. Y., rejected bids Oct. 2 general construction, steam tunnel at Grasslands, Valhalla in town of Mount Pleasant, VALHALLA, N. Y., LB **$573,500** Alt. A; LB **$825,000** Alt. B; LB **$1,040,000** Alt. C. Will re-advertise. CD 10/4, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 11/7,

**Brann & Stuart**, Box 998, Trenton, N. J., LB **$1,517,641** (13 bidders) constr. 3 trestle structures across Manahawkin Bay on Rte. S40 (1927), Rte. 72 (1953), Sec. 5F, Stafford Twp. and Ship Bottom Borough, Fed. Aid Proj. No. F-130(7), Ocean Co. CD 10/22.

### BUILDINGS—LB & CA

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y., LB **$1,660,000** (11 bidders), general contract, Public SCHOOL 279, Avenue "K" between E. 109 and 104 Sts., BROOKYYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, N. Y. Bids Nov. 12. CD 10/15.

▲ **John Rosenblum, Inc.**, 1860 Broadway, New York 23, N. Y., CA **$1,126,000** general contract JUNIOR HIGH SCHOOL 142, Henry, Rapelyea and Coles Sts., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Sept. 25. CD 9/30, under LB.

▲ **Skinner & Cook, Inc.**, 60 E. 42 St., New York 17, N. Y., CA Est. **$1,000,000**. NURSES SCHOOL and RESIDENCE for Benedictine Hospital, KINGSTON, N. Y. Archdiocesan Bldg. Comn., 451 Madison Ave., New York 22, N. Y. Henry V. Murphy, 1 Hanson Pl., Brooklyn 17, N. Y., archt.

▲ **Joseph Garry Co., Inc.**, 124 E. 40 St., New York 17, N. Y., CA **$1,500,000**. HOME for the Aged addn. for St. Patricks, NEW YORK, N. Y. Archdiocesan Bldg. Comn., 451 Madison Ave., New York 22, N. Y. York & Sawyer, 101 Park Ave., New York 17, N. Y., archts.

▲ **Margotta Constr. Co., Inc.**, 250 N. Washington St., North Tarrytown, N. Y., CA **$1,750,000**. St. Barnabas HIGH SCHOOL for Girls, NEW YORK, N. Y. Archdiocesan Bldg. Comn., 451 Madison Ave., New York 22, N. Y. Starrett & Van Vleck, 267 Fifth Ave., New York 16, N. Y., archts.

**John Rosenblum, Inc.**, 1860 Broadway, New York 23, N. Y., CA **$990,000**. general construction, Public School 38 addn. and modernization and conversion to JUNIOR HIGH SCHOOL, St. Ann's Ave. and Rea St., Bronx Boro., NEW YORK, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, N. Y. Bids Oct. 1. CD 10/4, under LB.

▲ **John W. Ryan Constr. Co.**, 11 W. 42 St., New York 17, N. Y., CA Est. **$1,500,000**. Good Samaritan HOSPITAL, SUFFERN, N. Y. Archdiocesan Bldg. Comn., 451 Madison Ave., New York 22, N. Y. William F. Schorn, 501 Madison Ave., New York 22, N. Y., archt.

▲ **Peter Camilli & Sons**, 75 Cooley St., Pleasantville, N. Y., CA Est. **$1,300,000**. SPORTS BLDG. for Marymount College, TARRYTOWN, N. Y. Archdiocesan Bldg. Comn., 451 Madison Ave., New York 22, N. Y. Eggers & Higgins, 100 E. 42 St., New York 17, N. Y., archts.

▲ **Vermilya-Brown Co., Inc.**, 100 E. 42 St., New York, N. Y., CA Est. **$20,000,000**, 24 story OFFICE TOWER BLDG. with two 7 story wings, Broad, Bank and Academy Sts., NEWARK, N. J. Prudential Insurance Co., 763 Broad St., Newark, N. J. Bids Oct. 29, awarded Nov. 8. CD 10/17.

▲ **H. K. Ferguson Co.**, 1783 E. 11 St., Cleveland, O., CA design and construct two stage catalytic reformer 10,000 bbl. per day unit, PERTH AMBOY, N. J. California Oil Co., 1200 State St., Perth Amboy, N. J.

▲ **Walter Kidde Constructors, Inc.**, 140 Cedar St., New York 6, N. Y., CA Est. **$1,500,000**, 4 story HOSPITAL addn., RED BANK, N. J. Bd. Trustees, Riverview Hospital, 35 Union Ave., Red Bank, N. J. Bids Oct. 8. CD 10/4.

▲ **Donald Aronow**, c/o Bankers Ltd., 60 Hamilton St., Paterson, N. J., Owner Builds. **$1,240,000**, 77 HOUSES, Fifth Ave., WOODBRIDGE, N. J. Edwin Gerber & A. Pancani, Jr., 11 Commerce St., Newark, N. J., archts.

▲ **Jos. F. Hughes & Co.**, 5 E. Franklin St., Baltimore 2, Md., LB **$2,537,250** (10 bidders) brick, concrete, steel, block, tile, terrazzo Severna Park JUNIOR-SENIOR HIGH SCHOOL, Severna Park, ANNAPOLIS, MD. Anne Arundel Co. Bd. Educ., Annapolis, Md. Bids Nov. 5. CD 10/31.

▲ **Merando, Inc.**, 4098 Mtnn. Ave. N.E., Wash., D. C., CA **$1,719,409** (base bid and alternate), Sligo JUNIOR HIGH SCHOOL, Silver Spring, ROCKVILLE, MD. Montgomery Co. Bd. Educ., Rockville, Md. Bids Oct. 24. CD 10/28, under LB.

## SOUTH

### HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 27 Kentucky

▲ **Ala., Huntsville** — BA 12/10 — Huntsville Water & Sewer Bd., City Hall, 54 in. outfall line, several service lines, branch line and disposal plant. $4,250,000. Goodwin Engineers, 2111-7th Ave. S., Birmingham, engrs. CD 8/21/56.

▲ **Ky., Covington**—ADMINISTRATION BUILDING—BA 12/10—Greater Cincinnati Airport, Donaldson Hy., Boone Co., 2 story, 85 x 95 ft., brick, rein.-con. administration building, $1,000,000. Plans deposit $50. Howard L. Elliston, 796 Walnut St., Cincinnati, O., archt. Hall McAlester & Stockwell, 705 Walnut St., Cincinnati, O., engrs. CD 1/16.

### BUILDINGS—BA

▲ **W. Va., Huntington**—FEDERAL OFFICE—BA 12/10—General Services Admin., 18th and F Sts. N. W., Wash. D. C., constr. and finance federal office bldg., $3,250,000 (25 year repayment). CD 12/27, under LB.

▲ **Ga., Atlanta**—COMMUNICABLE DISEASE CENTER—BA 12/13—General Services Admin., P. Bldg. Service, 18 and F Sts., Wash., D. C., finance and construct communicable disease center for Public Health Service. $11,500,000 (25 year repayment). CD 1/22.

### HEAVY CONSTRUCTION—LB & CA

▲ **NORTH CAROLINA**—State Hy. Comn., Raleigh,

N. C.—**Bowers Constr. Co.**, Box 1706, Raleigh, N. C. CA **$1,909,985**, structures on relocation US 158 from point southwest of N. C. 801 in Davie Co., northeast to West City limits of Winston-Salem, 8.17414, 1-35 (11), Davie and Forsyth Counties. CD 11/6, under LB.

N. C.—**Wannamaker & Wells, Inc.**, Orangeburg, S. C., CA **$944,916**, structures US 70 relocation from point south of Efland, east toward Durham Co. Line, 8.14570 1-725 (1), Orange Co. CD 11/6, under LB.

▲ **Southwest Lousiana Electric Membership Corp.**, C. J. Gojan, mgr., Lafayette, La., Owner Builds. **$1,030,000**. 382 mi. distr. lines and sys. imprvs., Lafayette Parish (La. 9AD. Lafayette), LOUISIANA. CD 10/11.

## MIDDLE WEST

### HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 26 Indiana December 11 Michigan
STREETS AND ROADS
November 20 Indiana November 26 Ohio
December 11 Michigan

### BUILDINGS—BA

▲ **Wis., Green Bay**—POST OFFICE—BA 12/12—General Services Admin., 18 and F Sts., Wash., D. C., constr. and finance post office. $1,550,000 (10 year repayment). CD 12/27.

### HEAVY CONSTRUCTION—LB & CA

▲ **INDIANA** — State Hy. Comn., State House Annex, Indianapolis,

**Hunt Paving Co. & Smith & Johnson, Inc.**, 1799 Kentucky Ave., Indianapolis, Ind., CA **$1,453,741**, est. $1,876,461, Type C c. conc. Road No. 31 south of Southern Ave. to Delaware St. in Indianapolis, Proj. No. U-3(8), Contr. R-4222, Marion Co. Bids Sept. 10. CD 9/20, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,

**Fruin-Colnon Co.**, 1706 Olive St., St. Louis, Mo., and **H. H. Hall Co.**, 200 St. Clair Ave., East St. Louis, Ill., CA **$2,623,682**, 19 span railroad grade separation structure on FAI-7, East St. Louis, St. Clair Co. Bids Oct. 8. CD 10/11, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,

rejected bids Nov. 1, 5.65 mi. storm sewer in 95 St. near Evergreen Park, Cook Co., LB **$1,846,890**. CD 11/8, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Springfield,

rejected bids Nov. 1, WF beam grade separation East Ave. inter Congress Expressway, Cook Co. LB **$1,190,362**. CD 11/8, under LB.

▲ **WISCONSIN**—State Hy. Comn., State Office Bldg., Madison,

**F. F. Mengel Co.**, Box 466, Wisconsin Rapids, Wis., CA **$1,057,940**, grade, base and b. conc. 2.905 mi. West Capitol Drive (North Lovers Lane, North 60 St.), S.T. Highway 190, cities of Milwaukee and Wauwatosa, Proj. U 06-1(37), Contr. 1, Milwaukee Co. Bids Aug. 6. CD 8/12.

▲ **MICHIGAN**—State Hy. Dpt., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing, Bids opened 11/6,

Mich.—**Jutton-Kelly Co., W. J. Stover Co. & Cooke Contg Co.**, 1116 Penobscot Bldg., Detroit, Mich., LB **$1,669,452**, est. $1,890,000 (5 bidders), three bridges to carry Harper Ave., Concord Ave. and N.Y.C. R.R. tracks over Edsel Ford Expressway, incl. grading, drainage and surf., Detroit, BI B 59 of 82-22-10 C2-U0 (I 09-1 13) BI 82024-C5 U0 (I 09-1 49) BI B62 of 82-22 10 C2-U0 (I 09-24) BI X13 of 82-22 10 C2-U0 (I 09-1-12), FAI, Wayne Co.;

Mich.—**Louis Garavaglia**, 24240 Mound Rd., Center Line, Mich., LB **$2,251,833**, est. $2,290,000 (14 bidders), bascule bridge and approaches relocation US-23 over Saginaw River 1 mi. north of Saginaw, BI B1 of 73-27-13 C2-UN (I 07-2 16) FAI, Saginaw Co. CD 10/17.

### BUILDINGS—LB & CA

▲ **Humel Constr. Co.**, 17706 Miles, Cleveland, O., CA **$1,000,000**. 3 story educational unit, CHURCH and PARISH HALL, adjoining present church, SHAKER HEIGHTS, O. Christ Episcopal Church, Warrensville Center Rd., Shaker Heights, O. Copper, Wade & Assoc., 10528 Wilbur, Cleveland, O., archts. CD 3/15.

**Sam S. Babilla Co.**, 933 W. 35 St., Gary, Ind., LB **$655,215**, Hemlock Elementary SCHOOL, sanitary sewer, culverts, concrete sidewalks, etc., Hemlock St. and Grand Blvd., GARY, IND. School, City of Gary, [illegible] and Virginia St., Gary, Ind. Yamaski, Leinweber & Assocs., 103 W. 5th St., Royal Oak, Mich., archts.

▲ **Sullivan-Smith Inc.**, 22963 Outer Dr., Dearborn, Mich., CA **$3,200,000,** 200 brick HOMES, "Crescent Estates" Middle Rouge Parkway, DEARBORN, MICH. Myers Hill Realty Co., (Agt.) 25249 Plymouth Rd., Detroit 28, Mich.

▲ **Beauty Built Homes, Inc.**, 8811 Puritan, Detroit 28, Mich. Owner Builds. **$3,700,000,** 150 face brick ranch HOMES, Dequinder and 11½-Mile Rd.; 100 face brick ranch HOMES, Stephenson and 13-Mile Rd., MADISON HEIGHTS, MICH.

## WEST OF MISSISSIPPI

### HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 27, 29 Missouri    November 29, Minnesota
December 2 Minnesota    December 11 Texas
STREETS AND ROADS
November 26 Colorado    November 27 Missouri
November 29 Minnesota    December 10, 11 Texas

▲† **South Dakota**—BA 12/18—U. S. Eng., 1709 Jackson St., Omaha, Neb., power structure, intake shafts and upstream tunnels Oahe Reservoir Proj., Inv. 25-066-58-53. CD 10/16, under LB.

### BUILDINGS—BA

▲ **Kan., Topeka**—PATIENTS TREATMENT UNIT—BA 11/26—State, Dpt. Admin., State House, Topeka, patients treatment unit at Topeka State Hospital. $2,000,000. John Brink, State House, Topeka, state archt. Kiene & Bradley, 903 W. 6 St., Topeka, archts. CD 4/3, under LB.

▲ **Tex., Midland**—OFFICE, etc.—BA 12/2—T. J. Bettes Co., c/o Continental Life Bldg., Fort Worth, Texas-Mortgagee, 10 story masonry glass and steel office, attached parking garage, $1,500,000. Chas. E. Armstrong, 1013½ University Dr., Fort Worth, Tex., archt. CD 10/25.

▲ **Mo., Kansas City**—HOUSING—BA 12/10—Kansas City Housing Authority, Joseph Brady, dir., 1220 Independence Ave., Kansas City, Mo., Chouteau Court Housing, 2 and 3 story (20 buildings). $1,700,000. Plans deposit $50. Glen E. Eidson, 11 E. Gregory, Kansas City, Mo., archt. CD 7/13/55.

▲ **N. M., Albuquerque**—FEDERAL OFFICE—BA 12/10—General Services Admin., 18th and F Sts., Wash., D. C., constr. and finance federal office bldg. $5,800,000 (25 year repayment). CD 1/23, under LB.

▲ **Iowa, Council Bluffs**—POST OFFICE, etc.—BA 12/11—General Services Admin., 18 and F Sts., Wash., D. C., constr. and finance post office and court house. $1,690,000 (10 year repayment). CD 1/24, under LB.

▲ **Neb., Omaha**—POST OFFICE, etc.—BA 12/11—General Services Admin., 18 and F Sts., Wash., D. C., design and constr. post office and court house. $9,130,000 (25 year repayment). CD 11/18/55, under Public Bldgs.

▲ **Kan., Kansas City**—POST OFFICE, etc.—BA 12/12—General Services Admin., 18 and F Sts., Wash., D. C., constr. and finance Post Office and Court House. $2,100,000 (25 year payment). CD 1/23, under LB.

▲ **Mo., Jefferson Barracks (St. Louis 23 P.O.)**—HOUSING—BA 12/12—St. Louis County Housing Authority, Robert J. Tracy, exec. dir., 1316 Sherman Dr., Lemay 23, Mo. 1 and 2 story, brick, frame dwellings (public housing proj. and management bldg.). $4,775,000. Leo A. Daly Co., Ambassador Bldg., 411 N. 7th St., St. Louis 1, Mo. CD 7/23/56.

▲ **Iowa, Burlington**—POST OFFICE—BA 12/13—General Services Admin., 18 and F Sts., Wash., D. C., constr. and finance post office. $1,180,000 (10 year repayment). CD 1/24, under LB.

▲ **Tex., Houston**—SHOPPING CENTER—Bids Asked—J. P. Boone, Real Estate, 4320 Alief Rd., constr. all or part of shopping center. $6,000,000. Lucian T. Hood, 2317 Bissonnet St., archt. CD 10/28.

▲ **Tex., Houston**—HOTEL—Bids Asked—The Rice Hotel, Main and Texas Sts. (selected list of bidders) 5 story hotel annex, swimming pool. $3,000,000. J. Russ Baty, 208 Bankers Mortgage Bldg., archt. Rob. Cummins, c/o Bankers Mtg. Bldg. and Dale S. Cooper & Assocs., 3815 Garrott St., engrs. CD 9/19.

### BUILDINGS—SLC

▲ **Colo., Lakewood**—SHOPPING CENTER—Stores Realty Co., 6067 Wilshire Blvd., Los Angeles, Calif., soon lets contract shopping center (first phase) incl. 2 story, part bsmnt., 122,000 sq. ft. May Co. Store, four 1 story shops, 4,135 car blacktopped paving parking area. $5,000,000. Raymond H. Ervin & Assocs., 1500 Denver Club Bldg., Denver, archts. CD 10/7.

### HEAVY CONSTRUCTION—LB & CA

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Iowa. CA **$8,909,912,** Stage VI, earthwork, Oahe Reservoir Proj., ENG-25-066-58-33, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Oct. 31. CD 11/6, under LB.

▲ **R. L. English Constr. Co.**, 3015 S. Post Oak, Houston, Tex. LB **$811,704,** est. $905,535 c.i. water mains, incl. 145,900 lin. ft. 2- to 16-in. pipe known as "Little York Rd. Proj.", HOUSTON, TEX. City, City Hall, Houston, Tex. Bids Nov. 6. CD 6/3/53;
**E. L. Harris Constr. Co.**, 815 Homes St., Houston, Tex. LB **$838,098** water mains, Laura Hoppe Rd., Jensen Dr., Halls Bayou and Hirsch Rd., (Houston, Tex.)

### BUILDINGS—LB & CA

**Dutoit Constr. Co.**, P. O. Box 6817 Parkway Station, Kansas City, Mo., LB **$975,251** general contract 3 story, ground floor, 161 x 261 ft., 35 classrooms MUSIC and APPLIED ARTS BUILDING, WARRENSBURG, MO. Central Missouri State College, Bd. Regents, Warrensburg, Mo. Bids Nov. 1. CD 10/16.

**Lippert Bros., Inc.**, 2800 N. Santa Fe St., Oklahoma City 5, Okla., CA **$700,000** cost plus, 2 DORMITORIES, Memorial and Eastern Rd., OKLAHOMA CITY, OKLA. Central Christian College, Bartlesville, Okla. Caudill, Rowlett & Scott, 1511 Clasen St., Okahoma City, Okla., archts. Awarded Oct. 23. CD 11/1/55, under Okla., Bartlesville.

▲† **Metropolitan Paving Co., Inc., Gill Constr. Co., Centex Constr. Co., Inc. and Link-Cowan Constr. Co.**, P. O. Box 3868, Oklahoma City, Okla., LB **$4,341,000** (Joint Venture) 268-unit family Capehart HOUSING units, Tinker Field, IFG 34-60-58-130, OKLAHOMA CITY, OKLA. U. S. Govt., Contg. Officer, OCPIF, Family Housing Proj. Office, Depot Procurement Div., Tinker Field, Oklahoma City, Okla. Bids Oct. 30. **(Correction**—name of low bidder). CD 11/7, under LB.

▲ **Manhattan Constr. Co.**, Manhattan Bldg., Muskogee, Okla., CA **$1,746,417,** childrens wing addn. to Hillcrest HOSPITAL, TULSA, OKLA. Hillcrest Hospital, 1653 E. 12th St., Tulsa, Okla. Bids Oct. 22, awarded Nov. 4. CD 11/13, under LB.

**Chambers Constr. Co.**, 1904 Taft St., Houston, Tex. CA **$914,950** JUNIOR HIGH SCHOOL in the Highlands, BAYTOWN, TEX. Goose Creek Ind. School Dist., Baytown, Tex. Bids Nov. 5. CD 11/12, under LB.

▲ **Cain Brogdon & Cain**, 2333 Grafton St., Fort Worth, Tex., CA **$1,250,000,** 135,000 sq. ft. floor space and parking area, Town and Country SHOPPING CENTER, FORT WORTH, TEX. Holaday Development Co., Inc., 832 Monroe St., Fort Worth, Tex. Awarded Nov. 9. CD 10/17.

▲ **Brown-Schrepferman**, 240 Washington St., Denver, Colo. CA Approx. **$1,510,000.** 6 story, 2 bsmnt., 108,000 sq. ft. OFFICE BLDG., East 8th Ave. and Grant St., DENVER, COLO. 777 Corporation, c/o Hamilton Management Corp., Speer Blvd., Denver, Colo. Bids Oct. 22, awarded Oct. 30. CD 11/1, under LB.

▲ **M. H. McKloskey, Inc.**, 1620 W. Thompson St., Phila., Pa. LB **$8,600,000** construct and finance POST OFFICE, DENVER, COLO. Post Office Dpt., 12th and Pennsylvania Aves. N.W., Wash., D. C. Bids Nov. 8. CD 10/11, under Public Bldgs.

▲ **Weaver Constr. Co.**, 5555 E. Evans St., Denver, Colo. LB **$1,326,619,** general contract 2 and 3 story, 136,400 sq. ft. Rishel JUNIOR HIGH SCHOOL, (Valverde Area) DENVER, COLO. School Dist. No. 1, 414-14th St., Denver, Colo. Bids Nov. 6. CD 10/31;
**Johnson & Davis**, 2235 Arapahoe St., Denver, Colo., LB **$385,000** mechanical contract, Richel Junior High School (Denver, Colo.).

## FAR WEST

### HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 3 Washington    December 5 California
STREETS AND ROADS
December 3 Washington    December 4, 5, 11, 12, 18 California

### BUILDINGS—BA

▲ **Calif., Pittsburg**—SCHOOL—BA 12/3—Pittsburg Unif. School Dist., c/o Supt., 2000 Railroad Ave., Junior High School, Yosemite and San Juan Sts. $1,000,000. Plans deposit $25. Satterlee & Tomich, 1521 I St., Sacramento, archts. CD 5/25/56.

### HEAVY CONSTRUCTION—LB & CA

▲ **ARIZONA**—State Hy. Comn., Phoenix,
**Isbell Constr. Co.**, P.O. Box 1710, Phoenix, Ariz. CA **$1,644,722,** est. $1,730,916, subgrade, seal, select material aggreg. base, bit. plant mix, seal coat 9.9 mi. U.S.-60 on Globe-Show Low Highway, Gila Co. Bids Oct. 25. CD 9/30.

▲ **Smale & Robinson**, 1033 North Avalon Blvd., Wilmington, Calif., LB **$1,607,730** (5 bidders) rein.-con. wharf facility at Berths 143 and 145, LOS ANGELES, CALIF. Los Angeles City Harbor Dpt., 1300 City Hall, Los Angeles, Calif. CD 12/14.

### BUILDINGS—LB & CA

**Haas-Haynie-Fransden**, 8913 Olympic Blvd., Beverly Hills, Calif. CA **$960,000.** 1 story, 54,000 sq. ft. COMMERCIAL TRAINING CENTER, 1111 N. Brookhurst St., ANAHEIM, CALIF. Chrysler Corp., 341 Massachusetts St., Highland Park, Mich. Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, Calif., archts.

**Bradley Estates**, 110 N. Doheny Dr., Beverly Hills, Calif., Owner Builds. **$840,000.** 1,319 sq. ft., 70 DWELLINGS, E. Norday, E. 163 St., S. McKinley St., S. Harvard, etc., LENNOX, CALIF.

▲ **William Simpson Constr. Co.**, 2401 Beverly Blvd., Los Angeles, Calif. CA **$6,000,000.** 6 story, 100,000 sq. ft., steel frame and gridwall Orthopedic HOSPITAL addns., LOS ANGELES, CALIF. Orthopedic Hospital, Adams and Flower Sts., Los Angeles, Calif. CD 7/24/56.

▲ **Steed Bros.**, P. O. Box 350, Alhambra, Calif., CA **$1,592,900** Stevenson JUNIOR HIGH SCHOOL, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Oct. 15, awarded Nov. 1, CD 10/21, under LB.

▲ **F. P. Lathrop Constr. Co.**, 800 University Ave., Berkeley, Calif., LB **$1,324,518,** Joaquin Miller JUNIOR HIGH SCHOOL, OAKLAND, CALIF. Oakland Unified School Dist., 1025-2nd Ave., Oakland, Calif. Bids Nov. 12. CD 10/10.

▲ **Lindgren & Swinerton** 1631 Beverly Blvd., Los Angeles, Calif., CA **$4,000,000,** 340,000 sq. ft., concrete South Bay STORE, REDONDO BEACH, CALIF. May Dpt. Store Co., 6067 Wilshire Blvd., Los Angeles, Calif. CD 2/26.

▲ **Seacrest & Fish**, 1909 W. Whittier Blvd., Whittier, Calif. CA **$1,143,362.** 2 story L shaped, 226x150 ft. face brick LIFE SCIENCE BLDG., RIVERSIDE, CALIF. University of California, Riverside, Calif. Bids Sept. 5. CD 9/13, under LB.

▲ **I. C. Curry, Inc.**, 1701 "B" St., San Diego, Calif., CA **$1,949,870,** 170,000 sq. ft. concrete masonry Madison SENIOR HIGH SCHOOL, SAN DIEGO, CALIF. San Diego Unified School Dist., 825 Union Ave., San Diego, Calif. Bids Oct. 17, awarded Nov. 1. CD 10/22, under LB.

## CANADA

### HEAVY CONSTRUCTION—LB & CA

▲ **Michaud & Simard, Inc.**, 575 Arago St. W., Quebec City, Que., LB **$1,891,845** (3 bidders) constr. 2 runways, 200x6,000 ft. each, with auxiliary taxiways and aircraft parking area, entrance road and road diversion at new Sault Ste Marie Airport, Point aux Cheres, near SAULT STE MARIE, ONT. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Oct. 31. CD 10/21.

**Sam Cossentino Ltd.**, 80 Hymus Rd., Toronto, Ont., CA **$992,000,** Contr. Nos. D11, D12, D13, East Don Sanitary Trunk Sewer, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Oct. 28, awarded Nov. 4. CD 11/6, under LB.

### BUILDINGS—LB & CA

▲ **Malcolm Constr. Co. Ltd.**, 554 Pembina Hy., Winnipeg, Man. CA Est. **$1,000,000** (10 bidders) 1 story 300x360 ft. steel frame, concrete block walls with asbestos siding WAREHOUSE, concrete floors, concrete fdn. on piles, WINNIPEG, MAN. International Harvester Co. of Canada Ltd., 301 Burlington St. E., Hamilton, Ont. Bids Oct. 21, awarded Nov. 5. CD 10/15.

▲ **Fassel Constr. Co., Ltd.**, 2201 Kingston Rd., Toronto, Ont., CA About **$2,000,000,** 5 story Structural steel, brick constr. with some curtain walling, rein.-con. main wing HOSPITAL extension, N. Algoma St., PORT ARTHUR, ONT. Sisters of St. Joseph of the Diocese of Sault Ste. Marie, Port Arthur, Ont. Fabbro & Townend, 251 Lerne St. S., Sudbury, Ont., archts. C. D. Howe Co., Ltd., Public Utilities Bldg., Port Arthur, Ont., engrs. Awarded Oct. 30.

▲ **Jackson-Lewis Co. Ltd.**, 10 St. Mary St., Toronto, Ont., CA Est. **$1,500,000** (10 bidders) 9 story 56x156 ft. stone, brick Church Head OFFICE BLDG., with 2 story tower at one end bldg., 81-99 St. Clair Ave. E., TORONTO, ONT. United Church of Canada, 299 Queen St. W., Toronto, Ont. Bids Oct. 15, awarded Oct. 24. CD 10/4.

▲ **Collet Freres Ltee**, 1978 Parthenais St., Montreal, Que., CA Est. **$1,500,000.** 3 story, 210x325 ft. brick walls, steel frame GARAGE, concrete fdn. Guizot St., MONTREAL, QUE. Hydro-Quebec, 10 Jarry St. W., Montreal, Que. Maurice Lagare, 279 Decarie Blvd., St. Laurent, Que., archt. Beaulieu, Trudeau, Dubuc, Lalancette & Beaulieu, 6650 Darlington Ave., Montreal, Que., engrs.

## U. S. POSSESSIONS

### HEAVY CONSTRUCTION—LB & CA

▲ **Hawaiian Dredging Co.**, Honolulu, T. H. and **Morrison-Knudsen Co., Inc.**, 319 Broadway Ave., Boise, Idaho, U. S. A., CA **$4,400,500.** 27,000 lin. ft. water conveyance and development tunnel, drilling wells, misc. pipe lines and diversion structures and appurtenance works MOLOKAI, T. H. Hawaii Water Autn., For Unit I, c/o Mgr., Chief Engr., Honolulu, T. H. Bids Oct. 24. CD 10/23, under LB.

## FOREIGN

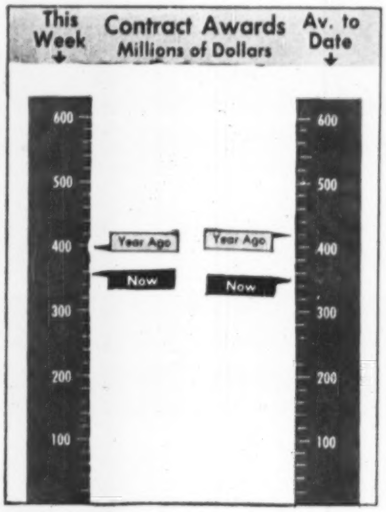
### HEAVY CONSTRUCTION—BA

▲ **Burma**—BA 12/7—Chairman, Bd. Management for Port of Rangoon, P. O. Box No. 1, Rangoon, Contract No. 2 development of Rangoon Port Rangoon Harbor Project. Plans deposit $275 per set from owner or $280 per set from Sir Alexander Gibb & Partners, Queen Anne's Lodge, Westminster, London, S.W. 1, Board's consulting engineers. Extended date. CD 9/23.

**(Proposal Advertisement see pp. 116 and 117)**

# Construction Scoreboard

## Activity this Week



### AMOUNT OF CONTRACTS LET

| By Ownership | This Week | Cum. 47 wks 1957 | Chge '56-'57 |
|---|---|---|---|
| | millions | | % |
| Federal | $23.6 | $2,115.0 | +36 |
| State and Municipal | 143.6 | 6,719.2 | +13 |
| Total Public | 167.2 | 8,834.2 | +18 |
| Total Private | 165.1 | 7,806.0 | −36 |
| U. S. Total | $332.3 | $16,640.2 | −16 |

| By Type of Work | | | |
|---|---|---|---|
| Waterworks | $7.0 | $332.7 | +3 |
| Sewerage | 11.3 | 504.2 | −6 |
| Bridges | 28.7 | 672.4 | +19 |
| Highways | 42.7 | 2,729.6 | +21 |
| Earthwork, Waterways | 12.6 | 919.9 | +37 |
| Buildings: | | | |
| Public, Excl. Housg. | 53.5 | 2,142.1 | +14 |
| Public Housing | 1.6 | 601.5 | +108 |
| Private Housing | 61.3 | 2,806.6 | −44 |
| Commercial | 57.4 | 1,619.2 | −8 |
| Industrial | 43.7 | 2,891.6 | −40 |
| Unclassified | 12.5 | 1,420.4 | −13 |
| U. S. Total | $332.3 | $16,640.2 | −16 |

**NOTE.** Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

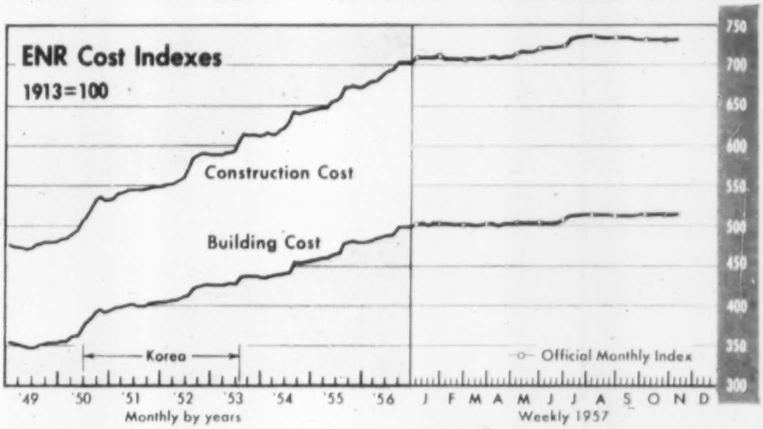
### NEW CAPITAL FOR CONSTRUCTION

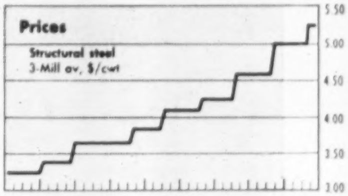
| | Week of Nov. 14 | Cum. 46 wks 1957 | Chge '56-'57 |
|---|---|---|---|
| | millions | | % |
| Corporate Securities | $31.5 | $5,209.1 | +22 |
| State and Municipal: | | | |
| All Except Housing | 133.5 | 4,957.3 | +20 |
| Housing | ... | 155.8 | +71 |
| Federal Loans | 0.4 | 182.7 | +36 |
| Federal Aid | ... | 2,161.2 | +102 |
| Total Nonfederal | $165.5 | $12,666.2 | +31 |
| Federal Appropriations: | | | |
| In U. S. | ... | $2,777.0 | −20 |
| Outside U. S. | ... | 29.0 | +82 |
| Total New Capital | $165.5 | $15,472.2 | +17 |

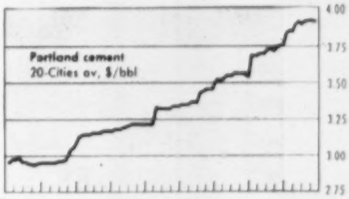
## Cost Indexes as of Now

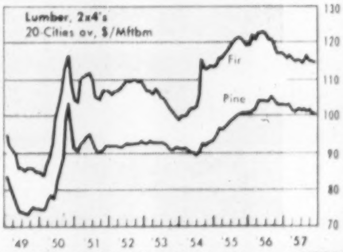
| ENR INDEXES (1913 = 100), 20-cities' average | Week of Nov. 14 1957 | % Change from Oct. 10 1957 | % Change from Nov. 15 1956 |
|---|---|---|---|
| Construction Cost | 738.38 | +0.2 | +4.9 |
| Building Cost | 517.76 | +0.2 | +3.5 |

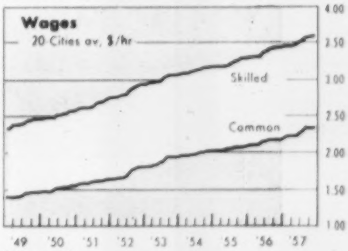
To convert above indexes to **1926** = 100: Divide Construction Cost by 2.080; Building Cost by 1.850
**1949** = 100: Divide Construction Cost by 4.770; Building Cost by 3.518







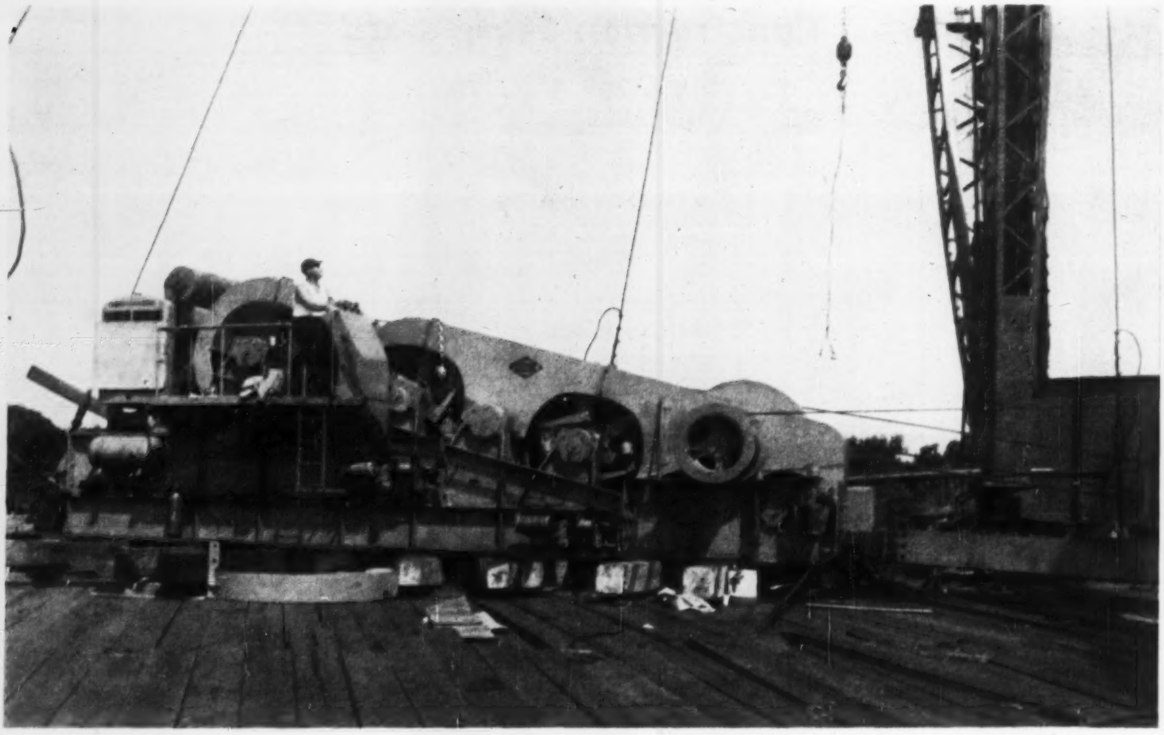




### ENR COST INDEXES IN 22 CITIES, 1913%100

| City | Construction Cost Nov. 1957 | Construction Cost Percent Change from last Month | Construction Cost Percent Change from last Year | Building Cost Nov. 1957 | Building Cost Percent Change from last Month | Building Cost Percent Change from last Year |
|---|---|---|---|---|---|---|
| Atlanta | 548 | 0 | +5.0 | 456 | 0 | +3.4 |
| Baltimore | 670 | 0 | +11.3 | 520 | 0 | +4.4 |
| Birmingham | 563 | 0 | +1.8 | 469 | 0 | +3.1 |
| Boston | 770 | 0 | +3.1 | 528 | 0 | +3.7 |
| Chicago | 836 | −0.1 | +5.6 | 528 | −0.2 | +4.1 |
| Cincinnati | 748 | 0 | +4.6 | 504 | 0 | +2.6 |
| Cleveland | 861 | 0 | +5.1 | 527 | 0 | +3.7 |
| Dallas | 547 | 0 | +2.4 | 451 | 0 | +0.4 |
| Denver | 710 | 0 | +2.0 | 522 | 0 | +0.6 |
| Detroit | 831 | 0 | +2.8 | 545 | 0 | +3.4 |
| Kansas City | 742 | 0 | +3.8 | 516 | 0 | +2.6 |
| Los Angeles | 778 | 0 | +6.4 | 513 | 0 | +4.1 |
| Minneapolis | 788 | 0 | +4.1 | 537 | 0 | +2.1 |
| New Orleans | 591 | +1.7 | +4.8 | 479 | +0.4 | +3.2 |
| New York | *888 | −0.1 | +5.1 | 591 | −0.2 | +3.5 |
| Philadelphia | 773 | 0 | +3.5 | 559 | 0 | +1.8 |
| Pittsburgh | 788 | −0.4 | +8.4 | 568 | −0.5 | +6.6 |
| St. Louis | 796 | 0 | +4.9 | 546 | 0 | +4.0 |
| San Francisco | 763 | +0.3 | +5.5 | 508 | +0.4 | +4.7 |
| Seattle | 756 | 0 | +4.4 | 467 | 0 | +3.3 |
| **U. S.—20 Cities' average** | **737** | **0** | **+4.7** | **517** | **0** | **+3.4** |
| Montreal | 591 | 0 | +5.0 | 453 | +0.7 | +3.0 |
| Toronto | 609 | 0 | +1.2 | 471 | 0 | +1.3 |

* Revised back to August 1957



# Clyde Hoists, with 42,000 pound line pull, handle big steel in stride!

**One of the Frame-12 Clyde hoists operating on the New England Turnpike. Full air controls for ease of operation, double brake bands for extra safety are but a part of the many advantages found in these better built hoists by Clyde.**

During a forty-minute interval, beginning at 4:19 A.M. on two successive Sundays, two Frame-12 Clyde Hoists, handled picks of 160 tons and 250 tons on the New England Turnpike at Stamford. That was the only interval free of traffic at the railroad terminal the turnpike crosses. Girders, up to 220 feet in length, had to be placed on schedule . . . and they were with Clydes! Clydes perform jobs impossible with ordinary hoists.

An on-the-scene engineer reported there was plenty of power for simultaneous hoisting and slewing. Clyde controls permitted smooth and accurate positioning of the girders and the performance of both hoists was outstanding.

**Clyde Hoists Are Available In A Complete Range of Sizes!**

Whatever your hoist requirements may be, you can capitalize on Clyde's more than a half century of hoist engineering and manufacturing experience. Clyde hoists are available in a complete range of sizes from 3,000 pounds to 80,000 pounds line pull . . . hoists that give smooth, positive control with safety and dependability.

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# Fed's Move May Trigger Construction

## Lowering of discount rate won't increase the supply of money, but it could signal further easing of credit

Last week's decision by the Federal Reserve Board to drop its discount rate from 3½% to 3% had a dramatic psychological effect on the financial world, but in itself did nothing to increase the supply of money. It did clear a lot of municipal and corporate debt paper off dealers' shelves, but as yet has brought no new bond issues hurriedly to market that will go toward expansion in the private and public fields of construction.

There is little doubt, however, that state and municipal governments that may have been delaying much needed facilities are watching the money market with a more optimistic and positive attitude.

A major investment advisory firm reported that the high interest rates that have been prevalent, definitely struck hard at some types of public construction and that the drop in the discount rate certainly has set a new trend for debt financing charges—mostly on the downward side.

• **Why it happened**—The action taken by the Fed, although surprising, was a move considered in most financial circles as "past due."

Pressure to ease credit had been exerted for some time. When the rate went up to 3½% last August, it was met by opposition from both outside and inside.

The New York District openly expressed dissatisfaction and was among the last of the 12 districts to act on the upward revision. This most recent change saw it among the first four to move downward, although the remaining eight districts are expected to follow suit—perhaps before the end of this week.

Pressure exerted on the Fed to relax its credit policies has been constant since last August. It rarely eased, and within the last two weeks became stronger than ever.

The pressure surge became more pronounced because:

• The Fed's own index of industrial production declined.

• Unemployment increased.

• Personal income was down.

• Bankers' acceptance of loans was down with the rate of borrowing by business in New York contracting when compared with the soaring borrowing that occurred throughout the same period last year.

The recent turn-about by Reserve Board Chairman William McChesney Martin came rather fast. Last summer he had testified before a Senate committee that he would want to see some prices turn sidewise or even down, before the tight money policy was changed. And only about two weeks ago, in a speech, he held to the same line of thought—that the policy should continue tight for some time.

But critics were voicing louder and louder protestations. Some portions of the banking community were being heard and, of course, politicians jumped into what looked like a good political act, with Rep. Wright Patman of Texas, scheduled to open his committee's hearing on the plight of small businessmen seeking loans. This hearing, which started yesterday, is bound to add to the noise that already has been created.

Each of the situations contributed to the about-face. It is also ironic that the Fed's turn-around came only a day after President Eisenhower's Oklahoma City speech when he announced there would be a degree of increase in military spending and that we could not gamble our security "worshipping the balanced budget." And along these lines, a New York investment man said that evidently the Fed is "changing its emphasis on the security of the economy to emphasis on security of the country."

• **Possible results**—Although the move by the Fed did nothing to increase the money supply, those in the investment world are considering the possibility that the reduction was a signal for other things to come.

Some speculated that before the end of this year the Fed will lower its reserve requirements for member banks. This would be a definite act to increase the supply of loanable funds, something that the mere reduction of the discount rate requirement could not do.

Meanwhile, the bond market in general, is expected by many in Wall Street to show a rather spasmodic quality for a while. As a result of the Fed's action, bonds of all types probably will spurt too high too fast, then fall back and adjust to a more stable level.

It is in this period of new stability that the state and local governments, and also business, will attempt to weigh the cost of new-project financing against need. Many public issues will undoubtedly come into the market place if the trend of rates seems favorable, because planning for new public works will be encouraged in the direction of earth-and-stone and brick-and-mortar reality.

There is also another phase to the money market that now must be watched and one that could shift the direction, if only slightly, in the corporate field. The prime interest rate—that rate charged by commercial banks to prime corporate borrowers—may also see revising. This short-term debt now costs 4½%, and because of the reduction in the discount rate it may be lowered to 4%. The bankers, however, are not committing themselves at present, and those outside the banking business but in the financial field are expecting the present rate to remain for a time.

• **And homebuilding?**—There are some sharp divisions in thought as to what the Fed's move will do for homebuilders. Some believe that the drop in housing starts resulted as much from a lack of demand as from lack of funds at low rates, therefore improvement, if any, will be slight.

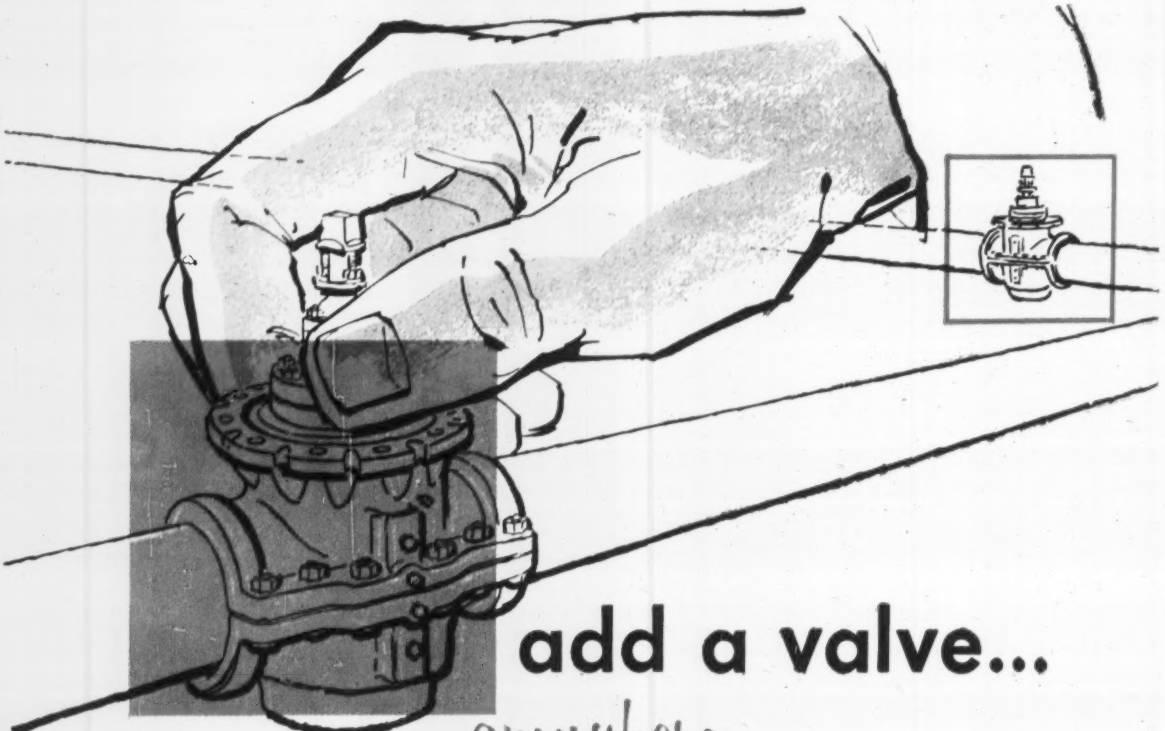
Others say that any move that serves to bring an easing within the money market will act to stimulate home sales and construction.

But, financial authorities are also agreed that the discount rate reduction will do little to reduce the cost of borrowing for the purchase of a home. Mortgage interest rates are regarded as the most "sticky" sector of lending when it comes to changes in interest rates.

There is acknowledgment, however, that it may make mortgages a more attractive lending field than it has been. Banks, insurance companies and savings and loan associations probably will make more funds available for mortgages. They may even increase the amount of loan-to-value ratio and in some cases offer longer repayment terms.

Either one or both of these acts could stimulate the housing market.

*(B&F continued on page 107)*



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## Banking on Industry

### Philadelphia sets up new industrial land "bank"

Philadelphia has established an industrial land bank with the signing of two bills by Mayor Richardson Dilworth that permits the city to turn over industrial land to the Redevelopment Authority for direct sale or lease to new industries.

The first "deposit" was 113 acres adjoining the North Philadelphia Airport in the northeast section of the city. Under the terms of recently enacted City Council legislation, all funds obtained by the Redevelopment Authority from the sale or lease of the first tract must be used for the purchase of new industrial land. The authority can also use the funds for the purchase and clearing of blighted industrial areas, but the City Council will have control over the expenditure.

The land bank plan, in this manner, will always have a revolving purchase money deposit after the first sale.

A second phase of the program is also expected to see the city joining with the Chamber of Commerce of Greater Philadelphia to form a jointly financed nonprofit corporation to advise on site preparation and coordination of promotional campaigns to obtain new industry.

There are approximately 1,200 acres available for industrial use in the area and the city and the chamber hope to develop it for industry at the rate of 300 acres a year.

## Kentucky Sells Road Bonds of $35 Million

Kentucky last week sold $35 million in highway construction bonds at an interest cost of slightly more than 2.9%. It was the first block sold of an authorized $100 million.

The bonds, having a maximum interest rate ceiling of 3%, were expected to be difficult to sell by some financing authorities. However, working in favor of the marketed issue was the fact that it would be the state's only outstanding bonded indebtedness.

## Open for Business

### Maine legislature acts to create building authority

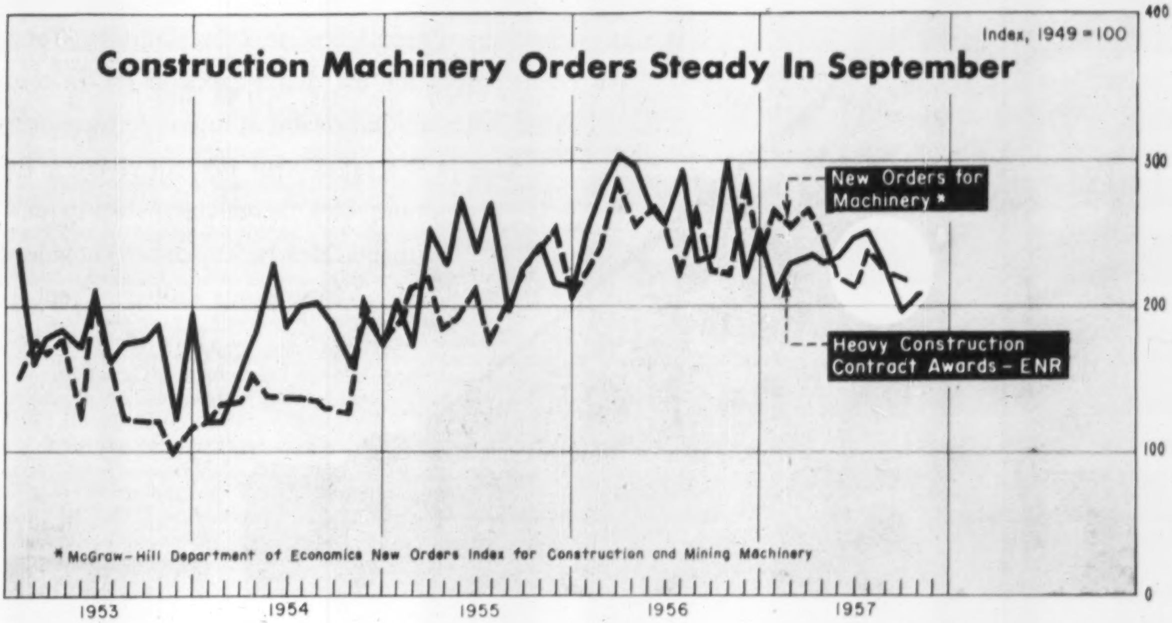
A recent special session of the Maine legislature, with only one dissenting vote, passed an act establishing the Maine Industrial Building Authority that will administer the state's program of insuring mortgages on new industrial buildings.

The issuance of up to $20 million in bonds to finance the insurance program was authorized by a constitutional amendment approved by the voters in September (ENR Oct. 3, p. 102).

Aimed at promoting the construction of new industrial buildings, the insurance program is believed to be the first of its kind in the country. Unlike some other states that have participated directly in the financing of new factories, Maine will insure only the payments on conventional mortgages taken by banks and other lending agencies.

The new Building Authority, con-

(*Continued on page 109*)



Construction Machinery Orders Steady In September

* McGraw-Hill Department of Economics New Orders Index for Construction and Mining Machinery

# But Some Up and Down Moves Are Still Possible

New orders for construction (and mining) machinery received in September by manufacturers were close to August's volume and nearly equal to September 1956, according to the McGraw-Hill Department of Economics index (see chart above).

The orders improvement since the low mark in June reflects the rise in heavy construction contracts during June and July as measured by ENR's contract volume index.

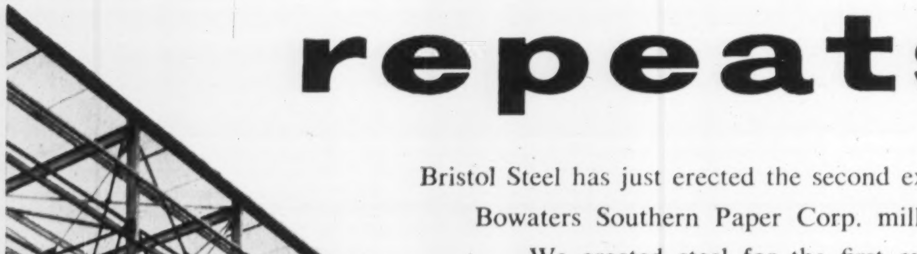
However, machinery orders may dip in the fourth quarter in line with the construction awards drop since the high of July. August volume was the lowest for any month since August 1955. And although October produced an increase in contract volume to an index value of 217, based on 1949=100, it was still well below the February-July '57 rate.

But contracts are expected by ENR to be higher on average in the current quarter than in the last quarter. A higher awards volume in this quarter would put a floor under any decline in machinery orders and could bring a corresponding increase in contractors' ordering by year end.

Addition to accommodate a fourth papermaking machine at Bowaters Southern Paper Corp. mill at Calhoun, Tenn.

## There's bound to be a reason for our record of ...

# repeats!



Bristol Steel has fabricated and erected more than 6000 tons of structural steel during major expansions by Bowaters over the past two and one-half years.

Bristol Steel has just erected the second expansion of the huge Bowaters Southern Paper Corp. mill at Calhoun, Tenn. We erected steel for the first expansion there, completed last year. Our record of repeat performances such as this ranks with anybody's! We invite your inquiries for structural steel requirements. Nearly 50 years of know-how insures our ability to "repeat" ...........with you too!

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sisting of nine members to be appointed by the governor and Executive Council, is authorized to guarantee loans up to a total of $20 million, with a limit of $1 million on any one project. The insurance can be provided only for those mortgages pledged by local non-profit development corporations, which themselves must have at least a 10% equity in the buildings they construct.

The plants so constructed, would then be leased to private industry by the local development corporation. Lease-purchase agreements also are permitted.

The special legislative session appropriated $500,000 to put the Building Authority in business. To build up the insurance fund, an insurance premium of not more than 2½% of the total mortgage will be charged. Proponents of the plan estimate that a premium of only ¼% will prove to be sufficient.

Although the governor and the council have the authority to issue bonds to back the program, many believe that bond sales will prove unnecessary.

## Roadbuilding Firms' Data May Be Revealed by State

Information about a contracting firm's ownership, experience, performance record, officers and partners may be made public by the Kentucky Highway Department as a result of a decision by Gov. A. B. Chandler. The information is part of data contractors must submit to the highway department to obtain a certificate of eligibility entitling them to bid on road jobs. Details of the contractors financial position, which also are submitted, won't be revealed, however.

The governor's decision resulted from a request by a newspaper reporter. Although the information filed by contractors always has been treated as confidential, the governor said it was his policy to "make available all information to the press that I can possibly make in good conscience and without divulging information of the type which could do serious damage to some of our citizens."

The data about ownership and firm experience will be issued upon request and after the contractor has been asked to approve its release in writing. In the future, a spokesman for the governor said, contractors will be put on notice that such information will not be regarded as confidential.

At present, the only public listing of qualified contractors issued by the highway department merely cites the firm name and address and whether it is a corporation, partnership or individually owned.

# Construction to Buoy Economy

Construction will give a lift to the economy next year, according to building forecasts of the Commerce and Labor Departments. In their joint outlook released on Friday, they foresee a likely rise of 5% in spending on new work in 1958.

Total construction spending for next year is estimated at $49.6 billion, up $2.4 billion from the $47.2 billion estimate for this year. The 5% rise exceeds a 3% maximum increase in costs anticipated for next year, denoting a real gain in physical volume of construction, measured in constant dollars. The rate of rise in construction costs has tapered off from about 5% at the beginning of the current year to about 3% now. It is not expected to be more than 3% for 1958.

The Commerce and Labor analysts foresee a rising trend for private residential, private utilities and public works construction. These increases outweigh an anticipated slight decline in private non-residential building, pulled down by an expected 9% drop in industrial construction resulting from a reduction in capital spending by business. The higher figure for housing next year is based on an estimated 1,040,000 to 1,050,000 new private home starts, as compared with less than a million for this year.

## New Construction Activity, Continental U.S.[1]

1956, 1957, and outlook for 1958

(millions of dollars)

| | Annual Totals | | | Percent Changes | |
|---|---|---|---|---|---|
| Type of Construction | 1956 | 1957 | 1958 | 1956-1957 | 1957-1958 |
| **Private construction** | $33,242 | $33,300 | $34,700 | [2] | + 4 |
| Residential buildings (nonfarm) | 17,632 | 16,530 | 17,575 | − 6 | + 6 |
| New dwelling units | 13,490 | 12,125 | 12,800 | −10 | + 6 |
| Additions and alterations | 3,695 | 3,915 | 4,250 | + 6 | + 9 |
| Nonhousekeeping | 447 | 490 | 525 | +10 | + 7 |
| Nonresidential buildings | 8,817 | 9,155 | 9,150 | + 4 | [2] |
| Industrial | 3,084 | 3,170 | 2,875 | + 3 | − 9 |
| Commercial | 3,631 | 3,585 | 3,775 | − 1 | + 5 |
| Office buildings and warehouses | 1,684 | 1,870 | 2,025 | +11 | + 8 |
| Stores, restaurants, and garages | 1,947 | 1,715 | 1,750 | −12 | + 2 |
| Other nonresidential buildings | 2,102 | 2,400 | 2,500 | +14 | + 4 |
| Religious | 768 | 870 | 870 | +13 | 0 |
| Educational | 536 | 525 | 540 | − 2 | + 3 |
| Hospital and institutional | 328 | 505 | 590 | +54 | +17 |
| Social and recreational | 275 | 300 | 300 | + 9 | 0 |
| Miscellaneous | 195 | 200 | 200 | + 3 | 0 |
| Farm construction | 1,560 | 1,600 | 1,600 | + 3 | 0 |
| Public utilities | 5,113 | 5,825 | 6,150 | +14 | + 6 |
| Railroad | 427 | 450 | 400 | + 5 | −11 |
| Telephone and telegraph | 1,066 | 1,075 | 1,000 | + 1 | − 7 |
| Other public utilities | 3,620 | 4,300 | 4,750 | +19 | +10 |
| Local transit | 25 | 25 | 25 | 0 | 0 |
| Pipelines | 350 | 375 | 375 | + 7 | 0 |
| Electric light and power | 1,845 | 2,100 | 2,350 | +14 | +12 |
| Gas | 1,400 | 1,800 | 2,000 | +29 | +11 |
| All other private | 120 | 190 | 225 | +58 | +18 |
| **Public construction** | 12,818 | 13,900 | 14,900 | + 8 | + 7 |
| Residential buildings | 292 | 505 | 850 | +73 | +68 |
| Nonresidential buildings | 4,072 | 4,470 | 4,710 | +10 | + 5 |
| Industrial | 453 | 455 | 450 | [2] | − 1 |
| Educational | 2,549 | 2,830 | 3,000 | +11 | + 6 |
| Hospital and institutional | 298 | 330 | 340 | +11 | + 3 |
| Administrative and service | 362 | 430 | 470 | +19 | + 9 |
| Other nonresidential buildings | 410 | 425 | 450 | + 4 | + 6 |
| Military facilities | 1,395 | 1,275 | 1,100 | − 9 | −14 |
| Highways | 4,470 | 4,825 | 5,500 | + 8 | +14 |
| Sewer and water systems | 1,275 | 1,345 | 1,270 | + 5 | − 6 |
| Sewer | 701 | 785 | 750 | +12 | − 4 |
| Water | 574 | 560 | 520 | − 2 | − 7 |
| Public service enterprises | 384 | 395 | 400 | + 3 | + 1 |
| Conservation and development | 826 | 965 | 950 | +17 | − 2 |
| All other public | 104 | 120 | 120 | +15 | 0 |
| **Total New Construction** | $46,060 | $47,200 | $49,600 | + 2% | + 5% |

[1] Joint estimates of the Department of Commerce and the Department of Labor.
[2] Change of less than one half of one percent.

# POWER LINES ALONG THE POTOMAC ARE PUT TO BED . . . "*IN THE DRY*"!

These four pipelines, running under the Potomac River, carry electrical transmission lines from Potomac Electric Power Company's Generating Station (seen in background) to Blue Plains, Washington, D. C.

To effect their connection to a substation, H. L. Gentry Construction Co., Washington, preferred to work in a dry trench, predrained by Moretrench Wellpoint Equipment. Fourteen feet of water in layered sand and gravel were handled with no trouble at all. Sheeting was eliminated.

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# Wage Gains Highest Since 1948

### Hourly wage rates for union construction workers show gain of 16 cents as upward pressure mounts

Chalking up their biggest wage gains in nine years, members of the building trades unions added an average of 16 cents an hour to their wage scales during the year that ended last July 1. This put the average rate for organized construction workers, including journeymen, laborers and helpers, at $3.20 an hour.

The figures were compiled by the U.S. Labor Department's Bureau of Labor Statistics and are based on a survey of 33 trades in cities with a population of 100,000 or more.

Average hourly pay of construction workers is somewhat higher, however, than the $3.20 figure. BLS has not included premium rates, overtime pay or vacation and holiday payments made directly to employees each pay period.

Present indications are that construction labor costs will continue to climb. Shaping future wage demands of many unions is the AFL-CIO conviction that a healthy economy requires expanding purchasing power in the hands of consumers. Coupled with this is an increasing emphasis by unions representing factory workers on a shorter workweek (with higher wage scales), on longer vacations and on income and employment security.

Because of the fluctuating nature of construction work and the high skills required of construction workers, the wage rates of building tradesmen have been traditionally higher than those of factory workers. Unions in the construction field are not apt to allow a drastic reduction in the existing differential. (In June, the average weekly hours of contract construction workers was 37.8; average hourly earnings were $2.87 and average weekly earnings were $108.49. Factory workers averaged 40 hours a week; their average hourly and weekly earnings were $2.07 and $82.80, respectively.)

The union scoring the biggest average wage boost in the BLS survey was the boilermakers with 20 cents an hour, giving members of the union a rate range of $3.25 to $4.46 as of July 1. Not far behind were the marble setters and plumbers, each with 19 cents an hour; pipefitters, paperhangers and rodmen with 18 cents an hour; and inside electricians, structural iron workers and tile layers with 17 cents. In the journeymen category, stonemasons were lowest with 10 cents. Carpenters and painters, each with average wage increases of 16 cents an hour, lead the bricklayers who scored an average of 14 cents.

Of the workers surveyed by BLS, 96% had received a wage boost of some amount during the year ending July 1. One-seventh of this group won at least 25 cents an hour and one-fifth received a 15 cent hourly wage boost.

According to the BLS figures, journeymen construction workers ended the period with an average wage scale of $3.39 and laborers and helpers with $2.45.

## Hot-Cargo Invalid?

### Labor board takes strong position against union's use of hot-cargo clauses

In an apparent effort to discourage unions from demanding hot-cargo clauses in labor contract negotiations, the National Labor Relations Board last week took the position that there isn't any way the clauses can be utilized without producing an illegal secondary boycott.

The decision—which represents the strongest position against hot-cargo clauses yet taken by the board—involved a teamster union local whose members refused to handle for common carrier shipment goods of a struck Atlanta, Ga., company. With one dissenting and two concurring opinions, the board held that the refusal to handle coupled with union advice that members were not required to handle the goods, constituted a violation of the secondary boycott provisions of the Taft-Hartley Act.

Strongest blow against hot-cargo clauses was dealt by board chairman Leedom and member Jenkins who consider the clauses "invalid at their inception." Messrs. Leedom and Jenkins, however, limit the application of their view to common carrier cases, their theory being that the Interstate Commerce Act does not permit discrimination towards customers. They left undecided the question of the validity of hot-cargo clauses with other types of employers.

Member Rodgers agreed that a secondary boycott existed but rested his conclusion on the union's encouragement of employees not to handle the goods. The contractual right not to handle, he said, was no defense and cannot "serve to immunize and condone unlawful conduct." Member Murdock, who considers the clauses valid, felt that the board majority was attempting to write new legislation. "Whether hot-cargo contracts are desirable or undesirable, whether or not they should be per se unlawful is a matter for Congress, and Congress alone, to decide," he said.

In another case, the issue is now before the U. S. Supreme Court.

## Right-to-Work Laws

### Union shop is outlawed by new county ordinance

A mounting controversy over right-to-work legislation gained new momentum this month when California's Sutter County enacted, over the protest of building trades and other unions, an ordinance banning the union shop.

The measure, passed by a 3 to 2 vote, is patterned after one adopted earlier in Tehama County. It is the fourth such ordinance enacted at the county level within the state, and will be effective in unincorporated areas of the state only. Other two counties with similar legislation are Trinity and San Benito.

Right-to-work legislation outlaws the union shop and other forms of union security clauses in labor contracts that impose union membership as a condition of employment. Although union shop clauses are authorized by the Taft-Hartley Act, Sec. 14 (b) of the law gives the states permission to ban them. Eighteen states have done so and California, which does not have a right-to-work law, is the first state in which political subdivisions have attempted such legislation.

The Trinity County ordinance has been held constitutional but the San Benito law has been declared unconstitutional by a lower court. Question on the way to the higher courts is whether the Sec. 14 (b) authorization extends below state levels.

Organized labor in California has already embarked on an educational program designed to defeat right-to-work legislation. More than a million copies of an AFL pamphlet on the subject have been distributed. Among the arguments presented against the measures are these:

*(Continued on page 112)*

- Most contracts have some form of union shop provision.
- Proponents of the union shop include such figures as President Eisenhower, Secretary of Labor James Mitchell, Gov. Goodwin Knight, Chief Justice Earl Warren and Adlai Stevenson.
- When a right-to-work bill was before the state legislature in 1953, "thousands of employers" urged its defeat because it "would menace long-standing industrial relations."
- Protestant, Catholic and Jewish spokesmen have condemned right-to-work legislation as "immoral."
- Union membership is only one form of many conditions of employment. Most of these are imposed by management or government.

## Council Members Named For Welfare Fund Control

California's program to regulate employee health and welfare funds has gotten under way with the appointment of a seven-member council to assist the State Insurance Commissioner in the surveillance of such funds.

The council was appointed under legislation approved at the last legislative session. The state is one of the first to enact such legislation.

In announcing the appointments, Gov. Goodwin J. Knight said the members "represent varying viewpoints, including labor, management, insurance, law and medicine."

"Members of labor unions throughout our state have, over the years, evolved a large number of fine, sound health and welfare insurance programs," the governor stated, "to provide for the security of themselves and their families."

"Millions of dollars in members' contributions are involved," he said, "in these funds. It is of the utmost importance that they be fully safeguarded and that any temptation they might offer to the dishonest or unscrupulous be effectively eliminated."

Among the new council members are Wilbur Bassett, executive secretary of the Los Angeles County Central Labor Council, and George Cos, attorney for the Southern California Chapter of the Associated General Contractors of America.

## Private Jobless Payments Win California Approval

Jobless benefit plans set up in union labor contracts with industry are not a bar to payment of state unemployment benefits.

The ruling—applicable in California—was made by the California Unemployment Insurance Appeals Board.

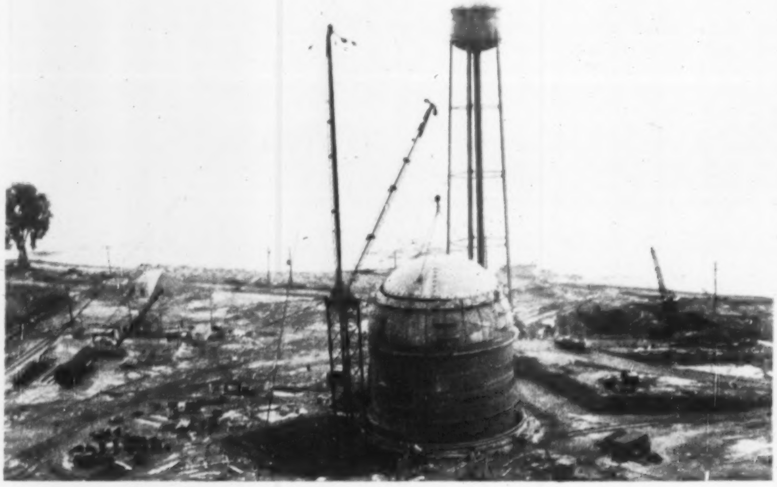
It was the board's first decision involving a private supplemental unemployment benefit plan where eligibility for state employment benefits was an issue.

In a split decision (2 to 1) the board ruled that an employee laid-off by Chrysler Corp. could draw state and private benefits simultaneously.

As of June, about 57,000 California workers were covered by 28 supplemental unemployment benefit plans established under collective bargaining agreements, according to a report of the state's Department of Industrial Relations. Some contracts with unemployment benefits already exist in the construction industry.

The board majority found that the claimant performed no services for Chrysler during the weeks he received state benefits and that he was not being paid by his employer to serve in a stand-by capacity while idle. Under the Chrysler plan, the employee was required to be available for work with other employers, to seek work and not to refuse suitable employment.

The board member who dissented took the view that the employer payments "arose out of and stemmed from the employer-employee relationship" and were "wages" within the meaning of the state law.



**Unions protest but construction proceeds on . . .**

# Michigan's Atomic Power Reactor

A brief calling upon the Atomic Energy Commission to halt construction of a $54 million sodium cooled reactor in Laguna, Mich., has been filed on behalf of three AFL-CIO unions.

The unions, which have urged and supported rapid development of our "Atoms for Peace" program, have opposed the Laguna fast breeder reactor on grounds of public safety. Submission of the brief was preceded by a lengthy AEC hearing on the safety issue initiated by the unions over a year ago when they intervened as interested parties under the 30 day protest clause in the conditional construction permit issued to Power Reactor Development Co. (ENR Nov. 15, 1956, p. 114).

Construction work has continued despite the safety hassle. Last month the dome or "beanie" was lowered into position on the gas-tight containment building that was later tested at 40 psi. The building, for which Chicago Bridge & Iron Co. is contractor, is a pressure vessel 72 ft in diameter and 180 ft high, projecting 72 ft above ground level.

Over the protest of local building trades unions, the auto, paper, electrical and radio workers unions have sought suspension of the construction permit. They claim the AEC erred in authorizing construction in a densely populated area without assurance that the reactor can be operated safely. PDRC officials, however, contend that the reactor, named after Italian-American physicist Enrico Fermi, will not be placed in operation—now scheduled for 1959—until "all essential safety experiments will have been conducted."

## NLRB Bans Strike

### Board follows earlier precedents in deciding jurisdictional dispute

A jurisdictional dispute between operating engineers and electrical workers was disposed of by the National Labor Relations Board last week with no significant change in NLRB policy on such disputes.

The board ruled that a union has no right to strike to force a contractor to abide by a decision of the National Joint Board for the settlement of Jurisdictional Disputes.

Arising under Sections 8(b) (4) (D) and 10 (k) of the Taft-Hartley Act, the case involved operation of an A-frame winch truck used in the erection of an electrical substation for the Texas Company at its Port Arthur refinery. The prime contractor assigned an electrician to operate the truck. In protest, all the operating engineers employed by the various contractors on the job struck for three weeks. The dispute was referred to the National Joint Board, which rendered a decision in favor of the operating engineers.

Claiming it was not bound by the Joint Board determination, the prime contractor continued to use the electrician on the winch truck. An unfair labor practice charge was filed against the operating engineers before the Joint Board decision was rendered. The NLRB hearing on the dispute occurred after the decision.

Following its past practice, the three member NLRB panel (chairman Leedom and members Murdock and Rodgers) found that the prime contractor was not bound by the Joint Board and that as a result the NLRB could entertain the dispute. (Although the contractor was a member of the National Electrical Contractors Association, which is a party to the Joint Board, he was not bound by the Joint Board, the NLRB said, by virtue of his NECA membership.)

The NLRB panel rested its decision against the operating engineers on two grounds:

1. Employers are entitled to make work assignments free of strike pressure unless they fail to conform to an NLRB order or certification, or unless the complaining union has a contractual right to the work it claims.

2. In this case, the operating engineers had no order, certification or contract claim to the work. They therefore had no legal right to try to force a change in the assignment.

This latest decision on jurisdictional

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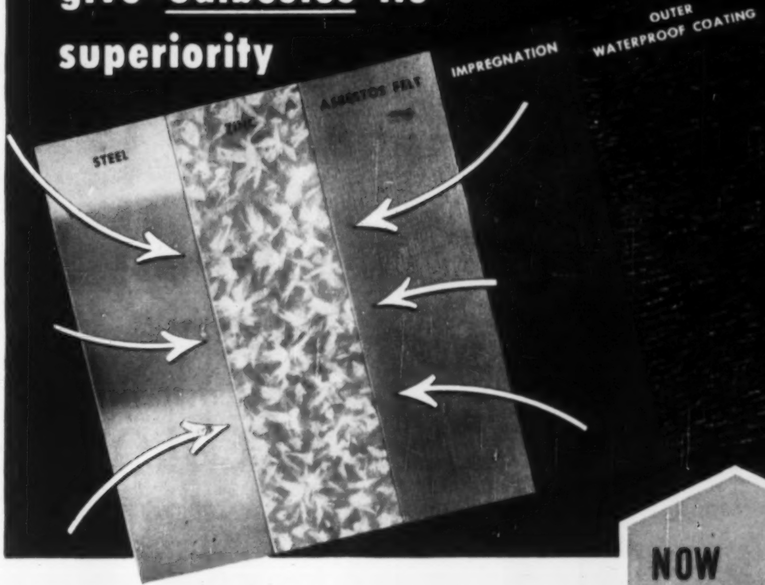

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disputes still leaves open to speculation the course the NLRB will take on the critical carpenter-lather dispute now before it (ENR Sept. 26, p. 102). Broad question involved in that case is whether, when all parties are bound by the Joint Board, the NLRB has any legal authority to enter a dispute. A negative answer would mean that the NLRB is powerless under such circumstances to prevent jurisdictional work stoppages even though the Joint Board itself has no power to stop them. The Port Arthur case may indicate that the NLRB will attempt to exercise its authority to prevent strikes but will continue to refuse to decide jurisdictional disputes on their merits.

## Construction Labor Costs Called a Critical Issue

A spokesman for the Building Contractors Association of New Jersey this week warned the building trades unions that "exorbitant" wage demands may be leading their members "to a false utopia of security."

Addressing the Rockland County, New York, Contractors Association Paul Brienza said management would have to assume a militant position unless the "spiraling wage rise" is checked. Result would be long work stoppages in next year's collective bargaining.

Mr. Brienza asserted that owner-investor protest against high construction costs has shelved many building projects. Calling for a temporary halt to wage increases in order to preserve present gains, he asked for a re-examination of labor's objectives.

## Labor Briefs . . .

- **Joint committee**—The new 16 member National Joint Cooperative Committee of the Associated General Contractors and the Council of Mechanical Specialty Contracting Industries meets this week for the first time. Restrictive clauses in labor contracts are on the agenda.
- **Tunnel strike**—The $36 million Clear Creek Tunnel unit of the Trinity River project in California was hit early this month by a two-day strike of laborers over pay for show up time when men reported but were sent home because landslides disrupted the construction schedule. Contractor has agreed to make show up time payments.
- **Bill vetoed**—Florida's Gov. Collins has vetoed a bill to put State Road Department employees on a maximum 40 hour week. He said the measure would have cost the Road Board an additional $4.5 million a year and would have jeopardized funds for highway projects.

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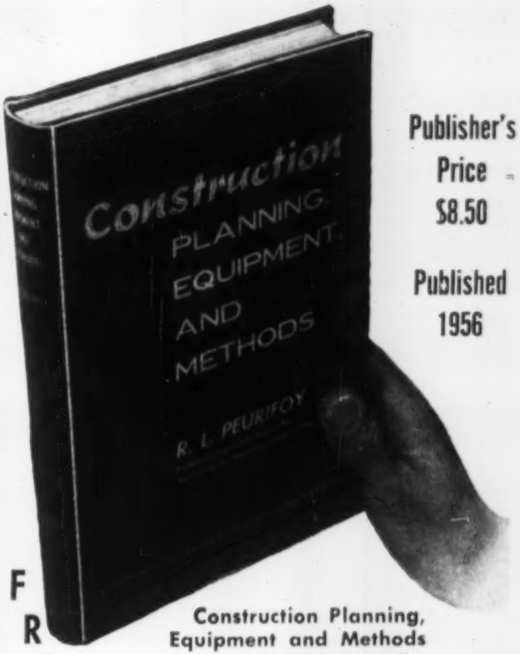

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☐ **Contracts, Specifications and Engineering Relations, 3d. Ed.,** by Daniel W. Mead and rewritten by the Staff of Mead and Hunt, Inc. and Joseph Reid Akerman. Publisher's Price, $7.00. Club Price, $5.95.

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# OFFICIAL PROPOSALS

Bids: December 2, 1957

## Soil Explorations and Foundation Investigations

NEW YORK STATE COLLEGES AT
CORNELL UNIVERSITY
NEW YORK STATE TEACHERS
COLLEGE AT CORTLAND
TOMPKINS AND CORTLAND COUNTIES
Spec. No. SM-110
NOTICE TO BIDDERS

Sealed proposals for the above project, in accordance with Specification No. SM-110 will be received by Henry A. Cohen, Director, Bureau of Contracts, Department of Public Works, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., on behalf of the Department of Public Works, until 2:00 o'clock P.M., December 2, 1957, when they will be publicly opened and read.

Each proposal must be made upon the form and submitted in the envelope provided therefor and shall be accompanied by a certified check made payable to the State of New York, Commissioner of Taxation and Finance, of 5% of the amount of the bid as a guaranty that the bidder will enter into the contract if it be awarded to him. The specification number must be written on the front of the envelope. The blank spaces in the proposal must be filled in, and no change shall be made in the phraseology of the proposal. Proposals that carry any omissions, erasures, alterations or additions may be rejected as informal.

The State reserves the right to reject any or all bids. Successful bidder will be required to give a bond conditioned for the faithful performance of the contract and a separate bond for the payment of laborers and materialmen, each bond in the sum of 100% of the amount of the contract. Corporations submitting proposals shall be authorized to do business in the State of New York. Specifications may be examined free of charge at the following offices.

(a) Bureau of Contract, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Wm. Robinson, District Engineer, New York State Dept. of Public Works, 333 East Washington Street, Syracuse, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City, New York.

Specifications may be obtained by calling at the offices of any one of the above and making deposit of $5.00 for each set or by mailing such deposit to the Bureau of Contracts, Department of Public Works, The Governor Alfred E. Smith Office Building, Albany, N. Y. Checks shall be made payable to the Department of Public Works. Proposal blanks and envelopes will be furnished without charge.

Dated: November 7, 1957.

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Bids: December 11, 1957

## Construction of a Police, Jail and Court Building

**Sealed bids** will be received until 11:00 A.M., EST, on December 11, 1957, in the office of the City Manager of Fort Lauderdale, Florida, for Project F-101—Police, Jail, and Court Building. The work includes the construction of the above-named facility according to plans and specifications—approximately 44,000 square feet of building.

Bidding blanks may be obtained at the office of the City Engineer. Plans and specifications are on file in the office of the City Engineer. A deposit of $40.00 for one set of plans and specifications, and of $25.00 for each additional set of plans and specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within ten (10) days after the opening of bids.

Bids must be submitted in a sealed envelope, addressed to the City of Fort Lauderdale, Florida, and the name of the bidder and the project must appear upon the outside of the envelope. A certified or cashier's check for $8,000.00, made payable to the City of Fort Louderdale, shall accompany each proposal as evidence of the good faith and responsibility of the bidder. The check of the successful bidder will be retained by the City as liquidated damages, should the successful bidder fail or refuse to enter into a contract with the City for the execution of the work embraced in the proposal. Checks of unsuccessful bidders will be returned within twenty-four (24) hours after acceptance of bid by the City Commission.

The City of Fort Lauderdale reserves the right to waive any informality in any bid, and to reject any or all bids.

WILLIAM J. VEEDER, City Manager

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Bids: December 3, 1957

## Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF
ADIRONDACK SUBSTATION
NEAR BELFORT, LEWIS COUNTY,
NEW YORK
SPECIFICATION NO. PA-8-10
CONTRACT NO. T-5

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of the Adirondack-Substation near Belfort, Lewis County, New York, until 10:30 A.M. Eastern Standard Time on the 3rd day of December, 1957, at the Authority's office 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

The work includes the construction of approximately one-half mile of structural steel 230 KV Transmission lines, and 230 KV substation complete with control building, fencing, landscaping and access road.

The work shall be completed on or before December 15, 1958.

Plans, Specifications and Proposal Forms may be obtained only from the Power Authority of the State of New York, at The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Twenty-Five ($25.00) dollars for initial set of Contract Documents and Fifteen ($15.00) dollars for each additional set, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, for the inspection by prospective bidders.

Bids must be made in duplicate in accordance with instructions contained in the information for Bidders Guarantee will be required with each bid in an amount not less than twenty (20) percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

---

Bids: April 8, 1958

## City of Baghdad
## Baghdad Sewerage Board
## Baghdad Drainage — Machinery
## Contract No. MI

TO MANFACTURERS OF DUAL FUEL
(DIESEL OIL/METHANE)
COMPRESSION IGNITION ENGINES

The Baghdad Sewerage Board invites Tenders for the manufacture, erection on site, and commissioning of the following equipment:—

CONTRACT MI. THREE DUAL FUEL ENGINES direct coupled to alternators of 460 KW at 3,300 volts, 428 r.p.m. and complete with engine auxiliaries: together with high and medium voltage switch and control gear, cables for the Solada Treatment Works site and other ancilliary equipment.

The Tender Documents and Contract Drawings may be inspected during normal working hours after November 7, 1957 at the offices of the Baghdad Sewerage Board, Baghdad, at the Royal Iraqi Embassies in Bonn and Washington, at the Royal Iraqi Legations in Brussels and Rome, and also at the offices of the Consulting Engineers, John Taylor and Sons, Artillery House Artillery Row, London, S.W. 1, and 464 Alwiyah, Baghdad. (Tel: 98736)

Copies of the Tender Documents and Contract Drawings may be obtained from any of the above-mentioned addresses on payment of I.D. 20 (Twenty Iraqi Dinars) or $56.00. This payment will not be returnable and must be made by check or Banker's draft payable to the Consulting Engineers.

The Tenders shall be in English and must be accompanied by a deposit of I.D. 5,000 (Five thousand Iraqi Dinars) or $14,000, either in case or by a letter of guarantee from an approved Bank in Iraq. The Tenders and accompanying documents must be enclosed in a sealed package which shall not in any way indicate the name of the Tenderer and must be delivered in Baghdad in accordance with the instructions contained in the Documents by 12 o'clock noon local time on the 8th day of April, 1958.

During the time allowed for tendering the Baghdad Sewerage Board reserves the right to amend the documents for the purposes of clarification or modification in design or contract conditions. Any such amendments will be notified in writing to prospective tenderers.

The Baghdad Sewerage Board does not bind itself to accept the lowest or any tender.

(Signed) FAKHRI AL FAKHRI
Chairman of the Baghdad Sewerage Board

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Bids: December 13, 1957.

## Sabine River Authority of Texas
## Iron Bridge Dam and Reservoir
## Sabine River, Texas

Sealed proposals for construction of Iron Bridge Dam and Reservoir will be received by the Sabine River Authority of Texas, P. O. Box 195, Greenville, Texas until 3:00 P.M. December 13, 1957 and then publicly opened at the Hunt County Court Room.

Principal items are 55,300 cubic yards of concrete, 4,810,000 cubic yards of compacted fill, 174,000 cubic yards of dumped riprap and other related work. Completion time 1,100 days. Plans and specifications will be furnished upon deposit of $40.00 per set. For particulars and/or documents address Forrest and Cotton, Consulting Engineers, 600 Vaughn Building, Dallas, Texas.

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### U. S. Government

Department of Commerce, Bureau of Public Roads, November 12, 1957. SEALED BIDS will be received at the office of the Regional Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., E.S.T., DECEMBER 10, 1957, for Project 100A1, George Washington Memorial Parkway, Montgomery County, Maryland. Grading and draining from Little Falls Branch to Taylor Model Basin. Length: 3.896 miles. The approximate quantities of the more important items are: 263,700 cu. yd. Excavation, 500,000 lb. Reinforcement Steel, 625 cu. yd. Stone Masonry, 4,200 cu. yd. Concrete and 7,600 sq. ft. Concrete Cribbing. Minimum wage has been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above. H. J. Spelman, Regional Engineer.

---

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## OFFICIAL PROPOSALS

Bids: December 9, 1957.

### Government of the Virgin Islands

INVITATION FOR BIDS
(Construction Contract)
060-121-57-F
060-20-58-F
November 5, 1957

Renovation and Extension to Washington School. Renovation and Extension to Lincoln School. Renovation to Commandant Gade School New Kindergarten and Community Center For Savan. (ALL ST. THOMAS, V. I.)

Department of Property & Procurement, Division of Procurement, Charlotte Amalie, St. Thomas, Virgin Islands.

Sealed bids in single copy for furnishing all labor, equipment, and materials and performing all work for the project described herein will be received until 2:00 p.m. Atlantic Standard Time, Monday, December 9, 1957, in the Senate Building (Bottom Floor—1st. door on left), Charlotte Amalie, St. Thomas, Virgin Islands, and then publicly opened.

Information regarding bidding material, bid guarantee, and bonds, plans and specifications and other contract documents are open for public inspection at the Office of the Public Works Commissioner, Charlotte Amalie, St. Thomas, Virgin Islands, and Charles L. Hilborn Associates, Consulting Architect-Engineers, 23 Crystal Gade, Charlotte Amalie, St. Thomas, Virgin Islands, for the following:-

ST-36—Renovation and extensions to Washington School
ST-37—Renovation and extensions to Lincoln School
ST-38—Renovation of Commandant Gade School
ST-28—New Kindergarten and Community Center for Savan

All in accordance with plans and specifications prepared by Charles L. Hilborn Associates, Consulting Architect-Engineers, 23 Crystal Gade, Charlotte Amalie, St. Thomas, Virgin Islands.

Copies of the plans and specifications may be obtained either from the Department of Property and Procurement, Charlotte Amalie, St. Thomas, Virgin Islands, 75 Kronprindsens Gade, (opposite of the Catholic School) or from the Consulting Architect-Engineers upon receipt of fifteen ($15.00) dollars which sum will be refunded upon return of the plans and specifications in good condition within ten (10) days after the date on which bids are received or else the entire deposit will be forfeited.

Each proposal must be accompanied by a certified check payable to the Government of the U. S. Government Virgin Islands or a bid bond to the favor of the Government from a reliable surety company authorized to do business in the U. S. Virgin Islands in an amount equal to two (2%) percent of the proposal. The certified check will be retained to pay for any damage or loss to the Government or the liability bond will accrue in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Government of the U. S. Virgin Islands reserves the right to consider bids for thirty (30) days after their receipt before awarding any contract and the right to accept a bid for the total, or any one or group of schedules one (1) to four (4), or to reject any or all of them.

For the guidance of contractors not familiar with the area, who may be interested in these projects, the architect-engineers estimate for the work is $100,000.00 to $150,000.00.

## OFFICIAL PROPOSALS

Bids: November 26, 1957

### Alterations & Additions to the Administration Building Broome County Airport

NOTICE TO BIDDERS

BID POSTPONEMENT: The time for receiving bids has been postponed from 11:00 A.M. Tuesday, November 19, 1957, to 11:00 A.M. Tuesday, November 26, 1957. The place for receiving bids remains the same: the office of the Clerk of the Board of Supervisors, Broome County Office Building, Binghamton, New York.

Howard Davis
Clerk, Board of Supervisors
County Office Bldg.,
Binghamton, N. Y.

Binghamton, New York
November 13, 1957

### U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5000) will be received at Ephrata, Washington until 10 a.m. Pacific Standard time December 19, 1957, for furnishing labor and materials for Earthwork, Concrete Lining and Structures; Esquatzel Diversion Canal, Station 0+00 to 555+82, Columbia Basin Project, Washington. Location near Pasco, Washington. Principal items are 1,836,000 cu. yds. of excavation 62,000 cu. yds. of concrete; installing 20'x32' radial gate and other metalwork; and other work. The work is divided into two schedules. Completion time 600 days. For particulars, address Bureau of Reclamation, P. O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

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### POSITIONS VACANT

**Superintendent experienced in heavy sewer &** water main construction under difficult conditions, by N. Y. State Contractor. Permanent position for qualified, responsible person looking for advancement with established firm. P-6165, Engineering News-Record.

**Heavy contractor, N. Y. State, needs man** to assume charge of take off, purchasing, engineering, expediting. Requires sound background & responsible field experience in heavier water, sewer & treatment plant work. Excellent opportunity for qualified person seeking & able to advance. Reply to P. O. Box 147, Colvin Station, Syracuse, N. Y.

**Experienced Sanitary Engineers with consultant.** Openings for project engineer and designers. Permanent. Send resume. Cleveland, Ohio. P-6467, Engineering News-Record.

**Superintendent, with wide experience on cofferdams** and bridge pier construction. P. O. Box 9802—Philadelphia 10, Penna.

**Sales Engineer—Preferably experienced in** estimating and detailing, reinforcing steel, etc. Engineering degree desirable. Established clientele—building and highway contractors Indiana and Illinois. State experience, educational background and salary requirements. Our employees know of this advertisement. P-6523, Engineering News-Record.

**Estimating—Design work with field experi**ence for general construction. Replies to 4545 North Keystone Ave., Indianapolis, Indiana.

### POSITIONS VACANT

**Wanted—Man 35 to 55 for position as** Safety and Employee Relations Supervisor with Construction Company working central U.S.A. area. Position requires man who works well with people. Give complete employment history. Martin K. Eby Construction Co., Inc., 610 N. Main, P.O. Box 1679, Wichita 5, Kansas.

**Wanted: Construction Contracts Manager.** Must be ambitious, aggressive man with experience in industrial construction. Not a routine "9 to 5" position. Top Salary to qualified individual, as executive in growing division of established firm with current projects in Midwest and on East Coast. P-6556, Engineering News-Record.

**Estimator—General Contractor, commercial,** industrial, and government construction, $100,000 and over—Washington, D. C. Only thoroughly experienced considered. Send resume of education and experience and salary required to: P-6610, Engineering News-Record.

**Soils Engineer with civil degree and at least** 15 years' experience to join construction supervisory staff of a large, long established company with extensive long-range expansion program. Successful applicant will supervise placement and inspection of graded material in rock fill earth core dam 300 ft. high. Preliminary work starting now and completion scheduled June 1961 with other projects in a ten-year program following. Applicant must furnish resume of experience with references relating to soils experience. Qualified applicant must pass physical exam similar to insurance exam at Company expense. Location in Southeast. Salary open. P-6607, Engineering News-Record.

(Continued on page 119)

## Director of Public Works

The Town of Natick, Massachusetts, 20 miles west of Boston, is inviting applications for the position of Director of Public Works.

His responsibilities will include charge of Water, Sewer, Highways, Equipment and Office staffs.

Qualification requirements are: supervisory experience in construction and administration, supplemented by a Civil Engineering degree or its equal.

Salary from $8300 to $9200—to be arranged.

Write for application form, or mail full details covering business and personal background, to:—

**Public Works Commissioner**
**NATICK MASSACHUSETTS**

## SALES ENGINEER

Challenging opportunity for experienced Construction Engineer to do sales promotion work for a major producer of precast and/or prestressed concrete products. Will call on Consulting Engineers and such governmental groups as municipal sanitary districts, state and federal highway engineering offices, etc. with broad line of well established items. All replies confidential. Our engineers know of this opening. Please give us full information about yourself, including education, experience, and present salary. Write

**P-6630**, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

# CIVIL ENGINEERS

**Positions in California State Government in a variety of locations throughout the State for recent college graduates.**

## HIGHWAY

Office and field work in California's dynamic highway program.

## BRIDGE

Design and field work in California's multimillion dollar bridge program.

## SANITARY

Engineering control of water supply and waste disposal, air pollution and industrial hygiene.

No experience required for Junior position.

**Junior positions**
**$481 to $530 a mo.**

Positions open at this level only.
U. S. citizenship required.

***Write for illustrated booklet:***

**C. S. Warner, Supervisor, Section E**
**801 Capitol Avenue**
**Sacramento 14, Calif.**

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# ENGINEERS DESIGNERS

**McKee** has permanent openings at their Cleveland, Ohio, offices for men with at least 3 years' experience in any of the following:

Oil Refineries
Blast Furnaces
Steel Mills
Industrial Plants

*In the following categories:*

Piping Checkers
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Broad diversification of work in our 3 engineering divisions assures you security of employment.

Send detailed resume to
G. VICTOR HOPKINS

**ARTHUR G. McKEE & Co.**
2300 Chester Ave., Cleveland 1, Ohio

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## ENGINEER—STRUCTURAL

**Preferably with Structural Steel fabricator experience. Exceptional long range opportunity.**

**PITTSBURGH BRIDGE & IRON WORKS**
**1601 Union Bank Bldg., Pittsburgh**

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# Highway Engineers - Designers & Draftsmen
# Bridge Engineers - Designers & Draftsmen
# Architectural - Designers & Draftsmen

**Permanent employment for qualified men. Ample opportunity for advancement based on merit; plus excellent retirement program, group life insurance, hospitalization, paid vacations and holidays. Salary commensurate with experience.**
**Architectural openings in Rochester, Pa. Highway & Bridge openings in Pennsylvania, Maryland, Mississippi, Ohio & West Virginia.**

**Air Mail Resume To: R. L. SHAW, *Personnel Director***

**MICHAEL BAKER, Jr., INC.** **Baker Bldg.** **Rochester, Pa.**

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# STRUCTURAL DESIGN ENGINEER

Established engineering-construction firm with Chicago and New York offices. This position in Chicago office. Experience with steam-electric and industrial structures and foundations necessary. Excellent opportunity to become part of expanding progressive company. Send confidential resume.

**P-6593**—Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

---

# General Sales Manager

## NORTHERN CALIFORNIA

A newly created position managing the world wide sale of our engineering construction services offers a challenging opportunity with high level responsibility for a man with the following qualifications:

Specifically, we seek a person between ages 35-45 to exploit business opportunities in new industries. He must be well-versed in executive selling and contract negotiations, and should be highly familiar with the general engineering construction field. He will be responsible for sales promotion and advertising, improving upon current sales activities, and the general coordination of the efforts of sales engineers. He reports directly to the General Manager. Salary is open.

We are a growing company headquartered in Northern California, engaged in the non-defense manufacture of pilot plants, heavy machinery, and related products. Our past performance and projected expansion of both operations and facilities represents well our interest in further growth and development.

In first reply, please include information regarding age, experience, compensation, and education. All replies confidential.

**P-6592**, Engineering News-Record
68 Post St., San Francesco 4, Calif.

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## BUSINESS CONNECTIONS

Manufacturer of longspan joists is desirous of expanding its area of sales. Any concern that is at present selling allied products to the construction industry reply to

**RW-6622**, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

*If interested in adding to your profits. Reply with brief history of your firm and products now handled.*

---

# CONSTR. SUPT.

**American mining corporation in Jamaica doubling its capacity requires capable, young civil engineer to supervise construction of small buildings, roads, tramways, and installation of equipment. Prefer previous foreign engineering and supervisory experience and interest in indefinite stay. Write immediately giving age, education, and experience.**

**P-6496**, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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**Structural Engineers.** Excellent opportunity with a consulting engineering firm in the paper industry, for men with a minimum of 5 years' experience in industrial building design.

Send a recent photograph and resume of education, experience, and family status together with statement of salary requirements. Also advise best time for interview.

**Central States Engineering, Inc.**
**1000 West College Avenue**
**Appleton, Wisconsin**

---

# ELECTRICAL ENGINEER

Electrical Engineer, preferably with hydroelectric plant background, to be responsible for all electrical installations in large hydroelectric plant located in the Pacific Northwest. State education, chronological experience and salary record, salary expected, reference and when available.

**P-6583**, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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# Mechanical Design Engineers

The Eimco Corporation, a rapidly expanding construction tractor and mine loader manufacturer, seeks engineers to assume responsibility for design and development of heavy mechanical equipment for mining and materials handling. Permanent positions. Company benefits.

If you are qualified by education and experience, we invite you to contact:

***Personnel Director,***
**The Eimco Corporation,**
**P. O. Box 300,**
**Salt Lake City, 10, Utah.**

## POSITIONS VACANT

(Continued from page 117)

**Civil Engineer for Public Works Department** of northern New Jersey suburban municipality for surveys and construction field and office. Good opportunity, excellent benefits and working conditions. State education, experience and salary requirement. P-6659, Engineering News-Record.

**City Engineer: Registered professional engineer** desired for City of approximately 30,000. Municipal experience desired but not mandatory. Full details of experience and qualifications should be furnished. Contact—City Clerk, Bowling Green, Kentucky.

**Superintendent experienced in concrete dam** construction both arch and gravity. Permanent position for qualified responsible person with established Colorado company. Only qualified persons apply. P-6640, Engineering News-Record.

**Graduate civil engineer 30-40 years of age** for work in Midwest. Require experience in control of concrete. Some experience in control of soils or bituminous mixes highly desirable. $8,000-$9,000 range. P-6666, Engineering News-Record.

**General Field Superintendent For Gunite** Swim Pool Construction. Large Westchester Swim Pool builder wants a man who knows every phase of gunite pool construction including costs, estimating, scheduling, recruiting, etc. We are particularly interested, but not exclusively, in the top general field superintendent of a gunite swim pool company who is dissatisfied in his present job, who feels he can go no further with his present company, or a number 2 man who is qualified for the top spot but can't get there because that job is filled. The job is permanent and pays well. Our employees know of this advertisement so you may write in confidence. References will not be contacted without your permission. P-6668, Engineering News-Record.

## EMPLOYMENT SERVICE

**Better Positions—$6,000 to $15,000. Want a** substantial salary increase, more opportunity or different location? This national 47 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo 3, N. Y.

## POSITIONS WANTED

**BCE 1950 Registered. Experience in highways**, surveying, municipal construction, and sales. Seek job with contractor, engineer or sales. PW-6527, Engineering News-Record.

**Structural Designer with 30 years rounded,** experience and some field—will prepare complete plan and liaison, or serve as employee with consultant, architect or contractor. Development work or investigation on full or part time. PW-6465, Engineering News-Record.

**Project Manager or General Superintendent.** Age 41. 19 years experience in heavy construction domestic and foreign. From estimating to completion. Highways Airfields Pipelines Disposal-plants. Prefer southeastern states—would consider other. Presently employed. Available Oct. 21. PW-6487, Engineering News-Record.

**Construction Supt. General construction.** PW-6317, Engineering News-Record.

**Estimator-General Construction BSCE, 33,** Registered. 10 years experience in estimating, design and construction. 6 years estimating includes buildings, industrial (paper, cement, steel, glass) and utility plants (boiler, sewage, water). Have held responsible positions including present. Desire to relocate in southeast. Anything considered. Prefer small, progressive Florida general contractor. Available 30 days. Rush. All replies acknowledged with detailed resume. PW-6559, Engineering News-Record.

**Master Mechanic—Plant Engineer, Supt. of** Maintenance, 15 years experience all types heavy equipment, erection and operation of sand & gravel, crushing, and asphalt plants, asphalt paving. Seeking permanent position with reliable co. or my experience for an interest. PW-6600, Engineering News-Record.

## POSITIONS WANTED

**General Superintendent, 27 yrs. experience** in all phases of Earth Moving Construction projects, especially Heavy Rock Work. Engineering background, Estimating experience, have large following competent skilled men. Available at once, will locate anywhere. PW-6611, Engineering News-Record.

**Project Engineer, 33 MSCE, Registered P.E.,** 11 yrs. experience in water supply, sewage disposal and drainage facilities investigation, design and construction, U. S. and overseas. Know Spanish. Desires permanent position with firm doing both U. S. and foreign work. PW-6472, Engineering News-Record.

**Desire position in South America. Civil Eng.** Single, M.S. in Structures and Soil Mech. Presently in well known design office. Field or office position acceptable. Available Feb. '58. PW-6639, Engineering News-Record.

**Foreign Employment in Americas or Caribean Area,** by Civil Eng. Grad (40) with wide experience and travel. Must be a reputable concern and position of responsibility. PW-6656, Engineering News-Record.

**Construction Supt.—C.E. 36, 13 years experience** in all types multi-million dollars construction, foreign and domestic. German, French, Portuguese, Spanish. Seeking a permanent assignment or plant maintenance considered. PW-6669; Engineering News-Record.

## POSITIONS WANTED

**General Superintendent—Chief Field Engineer,** C.E. and Surveyor, 23 years experience, heavy construction, mainly highways, railroads, bridges, watermain & sewers, irrigation & drainage, chemical plants, oil refinery, with corresponding engineering and administrative work from start to finish desires position with progressive contractor or consultant. Prefers foreign assignment if possible South America. Worked on three continents, fluently speaks Spanish, French, German and Italian. Back in New York area from foreign job by December 5. Resume of request. PW-6652, Engineering News-Record.

**Tunnel Gen. Supt., 49. Available Jan. 1.** 27 yrs. supervising some of worlds largest underground powerhouses, shafts, cassions, penstocks. Concreting same. Hard rock, soft ground. I get Progress. Help Estimate. Resume on request. PW-6662, Engineering News-Record.

**Project Manager or General Supt. Twenty** Five years experience in heavy construction, commercial and industrial buildings, dams, powerhouses, concrete and steel structures, will travel. PW-6663, Engineering News-Record.

**BSCE—5 yr. school. One yr. experience.** Desires position in Structural Consulting Office. PW-6664, Engineering News-Record.

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*NEW YORK: P. O. Box 12 (36)*
*CHICAGO: 520 N. Michigan Ave. (11)*
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## WORK WANTED

**Sub-contractors for bridge and highway design** & drafting, & for steel detailing desired by established engineering design office. Experienced & prompt service. Registered N. Y. & N. J. WW-6651, Engineering News-Record.

## CONTRACT WORK WANTED

**Design, specifications, contract drawings, for** all types of simple, continuous, and long span bridges. Tight time schedules met. Professional Engineers. Bridgeway Associates, 127 Liberty St., N.Y.C.

## PART-TIME WORK WANTED

**Engineer-Licensed P.E. & L. Surveyor desires** part time work in N.Y.C. area. Structural Design etc., Estimating for contractors, or office computations for surveyor. Reasonable. PTWW-6650, Engineering News-Record.

## SPECIAL SERVICE

**Construction Personnel placement service.** Furnishing high grade constr. personnel to Contractors & Engineers, U. S. & Foreign, write G.M.C. Lucas, Construction Consultant, P. O. Box 3771, Sarasota, Fla.

**Quantity takeoff and complete estimates.** Architectural, Mechanical and Electrical. Also appraisals and budget estimates. Chas. M. Walker, BSME, R. E., Ph. 6-0647, 111⅛ E. University Ave., Champaign, Ill.

## WANTED

**Anything within reason that is wanted in** the field served by Engineering News-Record can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty third year.
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WILSON Engineering Corp.
College House Offices HARVARD SQ. CAMBRIDGE, MASS.

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ENGINEERING
NEWS-RECORD

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**Friday, November 22nd**

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**Up-To-Date**

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*in the east!*

400 Tractors plus scores of graders, shovels, cranes, scrapers and other allied lines of construction equipment.

SPECIAL:

Two model 12103 series 6-71 GM twin Diesels, with heavy-duty transfer gear with 1.77:1 reduction ratio, 2 24-volt starting motors and variable speed governors. **Price: $5,800 ea.**

*The* **FRANTZ** *Companies*

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We are also interested in purchasing your surplus material.

We assure you our prices will be the best obtainable.

## *Call* HY DRACHMAN

**STEEL CORPORATION**

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**For Sale—30" GAUGE**
**DIESEL ELECT. LOCOMOTIVES**

26 Ton, 220 H.P.—34 Ton, 310 H.P.

*For Details, Write*

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## FOR SALE AT BARGAIN PRICES

1. Chicago Pneumatic Wagon Drill
2. Approximately 2 tons Tool Steel, round and square, long lengths
3. One lot Elephant Trunks and funnels for concrete placement
4. Flume pipe of all sizes—6", 8", 10" and 12"
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9. One Bending Machine for reinforcing rods, with all necessary tools, "Klingelhofer"; will bend up to 1½"
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Ready for delivery "As Is" and "Where Is". Subject to prior sale.

Telephone New York City, JUdson 2-9364. Ask for Mr. Irving.

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900 Ft. span, fixed steel head tower 125 Ft. high, movable tail tower 60 Ft. high Diesel Power, New 1952, Discontinued 1954

BREW, WOLTMAN & CO., INC.
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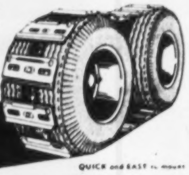
**Durable Drop Forged Steel Construction Interchangeable**



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**SIXTY DAY WARRANTY $5500.00 EACH**

BUFFALO SPRINGFIELD 12-ton Tandem #19557, Hyd. Steer, sprinkler system, diesel power.

HUBER 10-ton 3-wheel #10-821, hyd. steer. and hyd. scarifier, Hercules gas power.

GALION 10-ton 3-wheel #CG-15210, hyd. steer, hyd. scarifier, Hercules gas power.

GALION 10-ton Tandem, hyd. steer, UD-6 Diesel #R-25165.

UDELSON TRUCK SALES, INC.
3210 Woodland Ave. Cleveland 15, Ohio
R. Snyder Superior 1-1666

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- **1—Lima Model 1201 Cummins Diesel Late Model Crane — 70-ft. Boom Dragline 3½ cubic yards Clam 3½ cubic yards**
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This equipment is located in the Pittsburgh area.

Contact Murdock Equipment Company at 1001 Airbrake Avenue, Wilmerding, Pa. Phone Valley 4-5240 or Murdock Equipment Company, 680 Lexington Road, Union, New Jersey. Phone Murdock 6-4257.

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MANITOWOC MODELS 3500 & 3900

**Liftcranes**

**Forsythe Equipment Co., Inc.**
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**FOR SALE OR RENT**

1—1 yd Northwest Model 41 Diesel Crane
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1—315 Cu. Ft. Chicago Pneumatic Portable Air Compressor, Diesel Caterpillar 8 Engine. In rebuilt operating condition—mounted on truck...... $4000.00
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Stationary Compressors—All Sizes
1—McCarthy Coal Recovery Auger Drill complete with International Diesel Engine, 25—6' 30" dia. augers, etc.

For further information contact:

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1625 Nay Aug Ave. Scranton 9, Pa.

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| **Cat D8 w/Angledozer, 2U7800** | **$8,500** |
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| 105 | CFM | Worthington (diesel) |
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AIR COMPRESSOR CORP.
DELL AVE. & 48th ST., NORTH BERGEN, N. J.
Telephone UNion 5-4848

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## GMC 6x6 NAMED ARMY'S BEST ALL-AROUND TRUCK!

- Extra Pull Power!
- Double Traction for Mud!
- Special "Off Road" Design!

***UNUSED!***

***GUARANTEED! NEW-TRUCK PERFORMANCE!***

From Government Storage — these all-wheel-drive GMC 2½ ton 6x6's were specially designed by the U. S. Army to take the roughest terrain in all kinds of weather. These unused 6x6's can do the same job for you in all your truck jobs; whether in a muddy field or along a super highway. Processed—by Memphis Equipment Company—down to the last bolt to assure you of receiving the finest unused GMC 2½ ton 6x6 trucks available today. Parts available anywhere in the nation.

**For specifications, prices, delivery—write, wire or phone collect—JAckson 5-7841**

MILTON Y. TOOMBS, JR. Sales Manager

**MEMPHIS EQUIPMENT *Company***

ARMY TRUCKS • PARTS
CONSTRUCTION EQUIPMENT
766 SO. THIRD STREET • MEMPHIS, TENNESSEE

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*For Sale or Rent*

Model 1000 S/N 10-1488 mounted on International Truck Model RF192. New 1956. Excellent value. Offered subject to prior sale or disposition.

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*FOR SALE*

## 8″ DREDGE

18′ x 35′ hull, Georgia pump, G. M. 6-71 and G. M. 2-71, 500′ of pipe, excellent condition.

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Box 22 *Phone AXtel 6-2479* Tuckerton, N. J.

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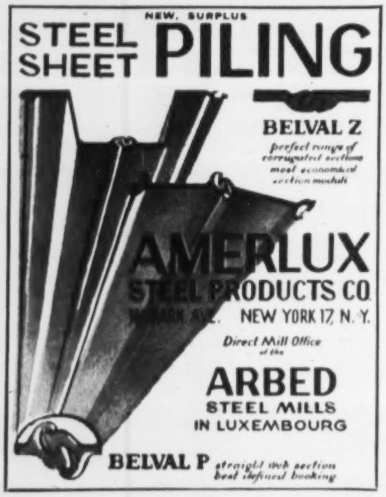

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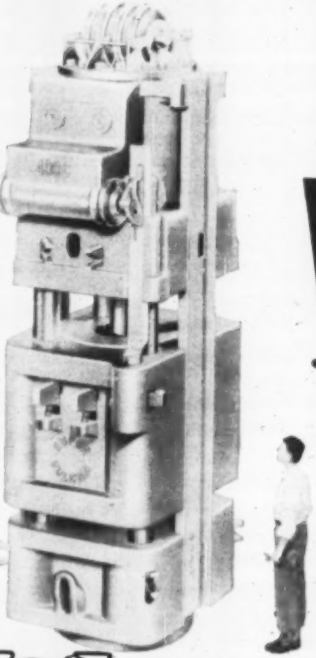

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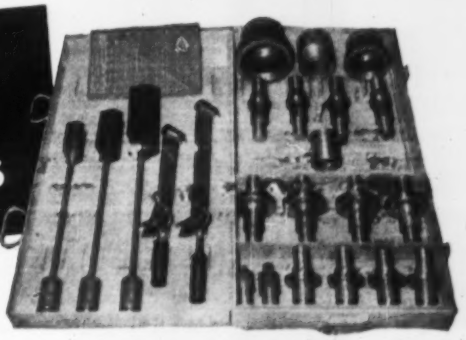

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# Editorials

## No Design Without Inspection

FIELD INSPECTION should be a part of every design contract. That it is not, is a cause for concern since many troubles—and some failures—could have been avoided if engineers had been present to insure that their designs were not misinterpreted.

None of the reasons that have been advanced for not doing the field inspection on his own designs seems strong enough to justify an engineer's risking his reputation by following such a course. If an owner won't pay reasonable inspection costs or insists on inspection by someone else, even after the dangers of such actions are explained, then the design contract can be refused. If the designer doesn't want to be bothered with field inspection, he will be extremely fortunate if he isn't bothered by more unpleasant duties as a consequence. If his office work keeps him too busy, he should give first preference to his field-inspection obligations before taking on new design assignments. Finally, if an owner argues that contractors won't take a job that is under an engineer's supervision, that job, too, can be refused.

Experience has shown that it is folly to assume that engineering drawings are so perfect that the designer's wishes can be followed without guidance. Many a job has gone wrong because the designer was not there when the lines he put on paper were translated into a structure. Design without designer inspection of construction is a hazard that need not and should not exist.

## Education in Construction

THE OBVIOUS GOOD SENSE with which engineering educators and construction leaders are solving the problem of imparting more knowledge of construction field practice and construction management requirements to civil engineering students stood out in our survey of construction engineering courses published in the November 7 issue, p. 23. None of the courses skimps on the very necessary founding in basic engineering science, which a college must provide, and this is as it should be. For no undergraduate course should be tailored to training men—as opposed to broadly educating them—for specific roles, whether these be structural designers, construction supervisors, public health guardians or what not.

It is a fact, however, that students need an introduction to the problems of construction management just as they do to theory and design practice. Given this background, however, the rest of their education must come from training on the job after graduation. The four year training course that contractor Lou Perini is using in his organization, also described in the November 7 issue, p. 145, illustrates this procedure excellently. And although Mr. Perini apparently feels that he had to institute this training course because of a deficiency in engineering curricula, such field training programs can hardly be avoided if capable construction supervisors, who are also capable engineers, are to be developed.

One thing that a few more construction management courses interspersed in a civil engineering curriculum will do is to give the graduate a somewhat better start in the smaller contracting companies where a Perini-type training program is not so easily handled. W. A. Klinger, contractor of Sioux City, Iowa, and a pioneer in this matter of construction engineering education, had this as one of his objectives in proposing his five year course, which has been adopted by several schools. Even the small contractor, however, will have to give some attention to post graduate field training if sound construction management is to be perpetuated. And it must be if the construction industry is to grow in line with its responsibilities.

Construction engineering education is on the right track. Educators and construction people should continue to work together for its continuing improvement.

## Automation in Fire Fighting

THE FIRE RECORD for 1956 and 1957 contains some statistics indicating that changes are taking place that pose a challenge to designers: Can they design buildings for automation in fire fighting?

In the keynote address at the fall conference of the National Fire Protection Association, John A. Neale, president of the NFPA and chief engineer of the National Board of Fire Underwriters, noted that the current trend of property losses is up and in studying the record, he finds this peculiar situation: "The number of building fires did not increase as it might be expected to. In fact, there were somewhat fewer fires. However, the fires that occurred were bigger fires causing more property loss." The study led Mr. Neale to conclude that "our fire-prevention efforts are meeting with some degree of success, but we are losing ground in the field of fire extinguishment."

In about 90 of the reports issued last year NFPA found the fire department considerably undermanned. On the possibility that this is a permanent condition, building designers might well give more thought to fire safety in their structures and to aids or substitutes for the fire department. Naturally, the more automatic the device for fire extinguishment incorporated in a building, the better. One example is automatic sprinklers, coupled with automatic fire alarm systems, with provision for reliable transmission of alarms to the fire department. This combination has a hard-to-beat record, but the field is wide open for new ideas.

Automation in fire fighting is possible. More of it should be practiced in view of the continuing board record of fire losses.

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